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(19)

(54) SEALED BEAM HEADLAMP FOR MOTOR VEHICLES

(71) We ROBERT BOSCH GMBH. a German Company, of Postfach 50, 7 Stuttgart 1, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to sealed beam headlamps for motor vehicles.

Motor vehicle headlamps of hermetically sealed construction are being used to an increasing extent, since this enables satisfactory operation to be obtained over a longer period of time than is usually the case with headlamps which can be disassembled. Closed, so-called "sealed-beam" headlamps are known whose individual elements, such as the reflector, diffusing lens and source of light, form a unit which cannot be disassembled, the interior of the lamp, particularly the sensitive reflecting layer of the reflector, being protected by a protective gas. Although a headlamp of this type is rendered unserviceable even when it develops a slight defect and consequently has to be exchanged for a new headlamp, hermetically sealed headlamps are gaining in importance, since injurious exhaust gases and atmospheric moisture cannot enter the interior of the headlamp. Dulling of the reflecting layer, corrosion of the interior of the reflector, or tarnishing of the diffusing lens do not occur in this type of headlamp, which is of particular importance in view of present-day air pollution.

A headlamp of the above-mentioned type is already known whose diffusing lens is cemented to a sheet metal reflector and in which the electrodes supporting the filaments are guided through a metal base in an air-tight manner, a further caplike lamp plate being welded to the edge of the reflector to seal the bulb in the reflector. Further known headlamps of this type have an incandescent lamp provided with an annular groove into which the neck of the reflector is cemented by means of a sealing compound. The edge of the reflector is also cemented into a groove in the diffusing lens in a similar manner. However, the special purpose of this construction is to embed the edges of the reflector, which are subjected to corrosion in the sealing compound.

A further known embodiment of a headlamp of this type uses a glass socket which receives the electrodes and which has a metal centering ring which is inserted into the opening in the vertex of the reflector. A glass bulb can then be mounted on the ring, so that the electrodes are enclosed with their filaments directed towards the interior of the reflector. This arrangement enables the filaments to be aligned satisfactorily relative to the reflector, without the additionally required holder of the actual incandescent lamp having to participate in the adjustment.

The present invention is a modification of the invention described in our patent specification No. 1,442,422. The invention in that specification concerns a sealed beam headlamp for a motor vehicle, comprising a metal reflector which a diffusing lens attached thereto, the vertex region of the reflector containing an opening in which the bulb of a sealed halogen lamp is fixed by means of a socket and a lamp plate, in such a manner that the lamp is non-releasably and hermetically sealed within the reflector, the lamp plate being welded, soldered or cemented to or being moulded onto the rim of the opening.

Non-releasable is taken here to mean that the lamp cannot be removed without causing damage to the headlamp.

It has now been found that the socket can be dispensed with and that the above

headlamp can be modified by mounting the lamp either directly on the lamp plate or on the lamp plate by means of tubular members emerging from the lamp bulb.

In accordance with the present invention, therefore, there is provided a sealed beam headlamp for a motor vehicle comprising a metal reflector with a diffusing lens attached thereto, the vertex region of the reflector containing an opening in which the bulb of a sealed halogen lamp is fixed by means of a lamp plate in such a manner that the lamp is non-releasably, as herein defined, and hermetically sealed within the reflector, the bulb being fixed directly to the lamp plate, or being fixed to the lamp plate by means of tubular members emerging from the bulb, so as to be carried by the lamp plate and the lamp plate being welded, soldered or cemented to the rim of the opening.

Thus, the incandescent lamp is not cemented into an individual socket which is fixed within the opening by a separate plate but a sheet metal plate is connected to the lamp, on the one hand, in such a manner that completely air-tight connection to the filaments is provided and to the reflector on the other hand.

Since high temperatures occur when producing ducts in the lamp plate for the lamp electrodes, it is advantageous if the lamp plate is made from high-grade steel and has a cylindrical neck portion closed at one end by a base portion, a flattened bulb portion of the lamp being mounted directly in said neck portion of the lamp plate by means of cement. Furthermore, it is advantageous if each electrode passes through a respective tubular member, preferably made of glass, secured in said base portion of the lamp plate by means of a glass melt.

Alternatively when the lamp plate is of plate-shaped construction, similar tubular members may be arranged to project from the bulb portion and may fix the bulb to the lamp plate by being fused in respective openings in the lamp plate so that the correct position of the reflector geometry only needs to be determined when securing the plate to the reflector. Thus, final focusing is required only when joining the plate to the lamp bulb, a circumstance which considerably simplifies manufacture.

Equally, the lamp bulb can be accomodated in a substantially vibration-free manner if the tubular members project from the bulb portion and the lamp plate is fused directly to the bulb portion. Furthermore, this proposal has the advantage that only a single opening for the bulb portion is required in the plate.

The advantage of the present construction resides particularly in the fact that a pre-focussed structural unit comprising lamp bulb, lamp plate and plug group can be prefabricated from only a few individual parts and can be subsequently focussed in the reflector and secured in a gas-tight manner.

The invention is further described hereinafter, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a sectional side elevation of part of a first embodiment of sealed beam headlamp in accordance with the invention;

Fig. 2 is a sectional side elevation of part of a second embodiment of sealed beam headlamp in accordance with the invention; and

Fig. 3 is a sectional side elevation of part of a third embodiment of a sealed beam headlamp in accordance with the invention.

The sealed beam headlamp illustrated in Fig. 1 has a lamp plate 16 comprising a base 21, a side portion 23, a plate-shaped flanged ring 24 and a radially flanged ring 25. A lamp bulb 17' is secured in the lamp plate 16 in a gas-tight manner by means of cement 33. The lamp bulb 17', only the rear portion of which is shown, merges into a flattened portion 32 in which three molybdenum strips 110 are fused, each strip 110 being connected to a respective electrode 34 which leads out of the bulb portion 32. For the sake of clarity, only two of the three electrodes 34 are shown, the end portion of each electrode passing through a respective tubular member 35 made from glass and being conductively connected to a respective plug-type tag 37 by means of a soldered joint 39. Each tubular member is hermetically sealed in a respective opening 112 in the bottom 21 by means of a glass melt 36.

The unit which has been manufactured in this manner, and which comprises the plate 16, the bulb 17' and the plugs 37, has not yet been finally focussed relative to the optical axis 0 — 0. The correct position of the axis is sought and finally fixed only when joining the lamp plate 16 to the reflector 11 (only partially illustrated). The ring 25 is then connected to a neck 15 of the reflector 11 in an air-tight manner by means of a welded or soldered joint 26. High temperatures are required when fusing the tubular members 35 in the base 21, so that high-grade steel is preferably used as the material for the lamp plate 16. Surface-treated sheet metal would destroy the protective layer applied, and render it ineffective, when inserting the glass melt 36. The above-described securing of the lamp bulb 17' in the lamp plate 16 by means of cement 33 must be effected in such a manner that the vibratory stresses occurring during use do no result in the loosening of the bulb 17'.

Compared with the above-described arrangement, the three glass tubular

members 35 in the embodiment shown in Fig. 2 are fused in the bulb portion 32 in such a manner that one half of each tubular member 35 projects from the bulb portion 32 and is sealed in an air-tight and gas tight manner in the respective aperture 112 in the lamp plate 111 by means of cement 36. The arm 38 of the plug-type tag 37 is contiguous to the cement 36, the electrical contact between each molybdenum strip 110 and the plug-type tag 37 being established by the electrode 34 and a soldered joint 39 in the manner already described. For the sake of clarity, only one aperture 112 through the lamp plate 111 is shown in its entirety, while the other two apertures are only partially illustrated. In contrast to the first-mentioned embodiment, the lamp plate 111 illustrated in Fig. 2 is of plate-shaped configuration, so that the connection to the reflector 11 and the simultaneous focussing do not require a neck 15.

Fig. 3 shows a third embodiment in which the three glass tubular members 35 are fused in one plane in the flattened end portion 32 of the bulb 17' and approximately half of each tubular member projects therefrom, each arm 38 of the plug-type tags 37 being conductively connected to a respective electrode 34, and rigidly connected to the tubular member 35, by means of a soldered joint 39 in the manner previously described. However, in contrast to the embodiment shown in Fig. 2, the lamp plate 113 is fused directly in the bulb portion 32. The lamp plate 113 is welded or soldered to the reflector (no illustrated) in the same manner as in the embodiment of Fig. 2.

The above-described embodiments have the advantage that a unit comprising the lamp plate 16, the lamp bulb 17' and the plug group can be prefabricated only a pre-focussing operation being required. The final focussing of the unit is undertaken only when hermetically joining the plate 16 to the reflector 11. If the required high-grade steel weld between the lamp plate 16 and the reflector 11 should not be convenient, this connection can be made by glueing or cementing. This would have the advantage of preventing corrosion at the joints.

WHAT WE CLAIM IS:—

1. A sealed beam headlamp for a motor vehicle comprising a metal reflector with a diffusing lens attached thereto, the vertex region of the reflector containing an opening in which the bulb of a sealed halogen lamp is fixed by means of a lamp plate in such a manner that the lamp is non-releasably, as herein defined, and hermetically sealed within the reflector, the bulb being fixed directly to the lamp plate, or being fixed to the lamp plate by means of tubular members emerging from the bulb, so as to be carried by the lamp plate and the lamp plate being welded, soldered or cemented to the rim of the opening.

2. A headlamp as claimed in claim 1, in which the lamp has a flattened bulb portion from which the lamp electrodes emerge, the lamp electrodes extending through said lamp plate in a gas-tight manner, each electrode being soldered to a respective connection tag externally of said bulb portion.

3. A headlamp as claimed in claim 2 in wich the lamp plate is made of high-grade steel and has a cylindrical neck portion closed at one end by a base portion, the bulb being fixed directly to the lamp plate, so as to be carried thereby by means of cement securing the flattened bulb portion in said neck portion of the lamp plate.

4. A headlamp as claimed in claim 3 in which each electrode passes through a respective tubular member secured in said base portion of the lamp plate by means of a glass melt.

5. A headlamp as claimed in claim 4 in which the tubular members are made of glass.

6. A headlamp as claimed in claim 2 in which the lamp plate is of plate-shaped construction, and in which the bulb is fixed to the lamp plate by means of tubular members emerging from the bulb and each being fused in a respective opening in the plate, said tubular members projecting from the flattened bulb portion, and each electrode emerging from said bulb portion through a respective one of the tubular members.

7. A headlamp as claimed in claim 2 and in which the bulb is fixed directly to the lamp plate, so as to be carried thereby, by means of the lamp plate, which is in the form of a plate being fuxed to the bulb portion, and in which each electrode emerges from the bulb portion through a respective tubular member projecting from the bulb portion.

8. A headlamp as claimed in any of the preceding claims, in which the lamp plate has a flanged ring portion which is joined in a sealed manner to the reflector.

9. A headlamp as claimed in claim 2, in which the tags are of a plug-type.

10. A sealed beam headlamp constructed substantially as hereinbefore particularly described with reference to and as illustrated in Fig. 1 of the accompanying drawings.

11. A sealed beam headlamp constructed substantially as hereinbefore particularly described with reference to and as illustrated in Fig. 2 of the accompanying drawings.

12. A sealed beam headlamp constructed

substantially as hereinafter particularly described with reference to and as illustrated in Fig. 3 of the accompanying drawings.

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1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

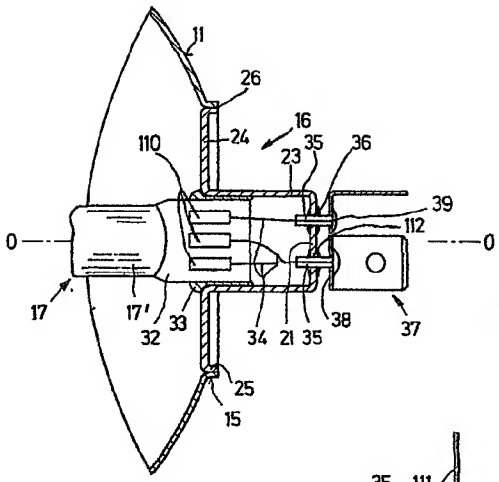

Fig.1

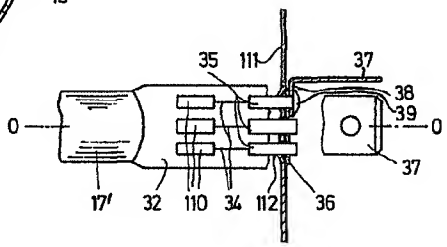

Fig.2

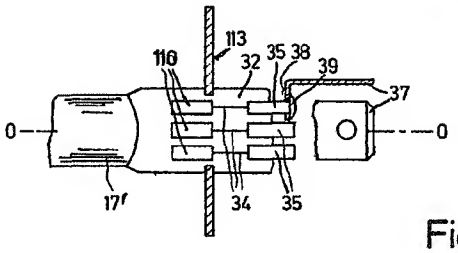

Fig.3

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(19)

(54) SEALED-BEAM HEADLAMP FOR MOTOR VEHICLES

(71) We, ROBERT BOSCH GMBH. a German Company, of Postfach 50, 7 Stuttgart 1, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement.

The invention relates to sealed-beam headlamps for motor vehicles.

Headlamps of sealed beam construction are used increasingly for motor cars because they provide efficient operation over a longer period of time than is the case with headlamp types that can be disassembled. Closed, so-called sealed-beam headlamps are known where the reflector, the diffusing lens and ring elements are combined to a single nit and where a protective gas permanently protects the inside of the headlamp, in particular the sensitive reflecting layer thereof. Although such a construction becomes unusable if a slight defect occurs and consequently has to be replaced by a new one, the gas-tight, sealed beam construction is gaining more and more in importance, because noxious exhaust gases and atmospheric moisture cannot penetrate into the interior of the headlamp. Consequently, dimming of the reflecting layer, rusting of the inside of the reflector, or tarnishing of the diffusing lens is largely avoided, which in view of to-day's air pollution is particularly important.

A sealed beam headlamp is already known whose diffusing lens is cemented to a sheet-metal reflector and wherein the electrodes supporting the filament are passed in an air-tight manner through a metal socket, a cap-like lamp-plate or dish being welded to the rim of the reflector. Further known headlamps of this type have an incandescent bulb with an annular groove into which the neck of the reflector is cemented by means of a sealing compound; in the same manner the rim of the reflector is cemented into a groove of the diffusing lens. It is the particular purpose of this latter construction to embed the edges, which are very much subject to rusting in the sealing compound.

In a further known construction of a sealed beam headlamp, a glass socket receiving the electrodes is used with a centering ring of metal, which can be fitted into the vertex opening of the reflector. A glass bulb may be fitted onto the ring so that the electrodes with their filaments are enclosed towards the interior of the reflector. In such a construction a perfect alignment of the filaments in respect of the reflector is achieved without the holder of the incandescent lamp actually having to take part in the adjustment.

One further known headlamp comprises a reflector having a bulb mounted, by means of a support assembly, in a non-sealed manner in a rear opening of the reflector. A removable cover is hermetically sealed against a portion of the reflector surrounding but slightly spaced from the opening. In a modified version of this headlamp a sealing member is interposed between a neck of the reflector defining said opening and said cover, the cover being releasably held against the sealing member to provide the hermetic seal.

In accordance with the present invention, there is provided a sealed beam headlamp for motor vehicles comprising a metal reflector with a diffusing lens attached thereto, the vertex region of the reflector containing an opening in which the bulb of a sealed halogen lamp is fixed by means of a socket and a lamp plate, in such a manner that the lamp is non-releasably, as herein defined, and hermetically sealed within the reflector, the lamp plate being welded, soldered, or cemented to or being moulded onto the rim of the opening.

Non-releasable is taken here to mean that

the lamp cannot be removed without causing damage to the headlamp.

The arrangement in accordance with the invention has the advantage that the bulb can be simply mounted in the headlamp by providing the reflector with a neck and without using a special centering device.

A manufacturing technique resulting in favourable production cost results, when the lamp has a flattened bulb portion from which the lamp electrodes emerge, the lamp electrodes extending through the lamp plate in a gas-tight manner and the flattened bulb portion being held in the socket by means of a cement.

Preferably, the socket is in this case formed from sheet metal and comprises a flange portion attached to the lamp plate and a conical funnel portion which receives the flattened bulb portion and the cement. Advantageously the lamp plate is also formed of sheet metal and comprises a flanged portion bearing an axially extending ring portion which is tightly sealed by a circumferential welded seam to the reflector neck. The passage of the electrodes through the lamp plate is solved in a simple manner if the lamp plate has a base having a respective aperture therethrough for each electrode of the lamp into which a length of tubing is sealed by means of fused glass, each length of tubing being joined by a soldered joint to the electrode passing through it.

It has been found to be appropriate to provide a construction in which a ring having an inwardly directed flange on one axial end and a number of inwardly directed lugs on its other end engages over the reflector neck, the annular trough thereby formed between the ring and the reflector neck receiving a synthetic resin compound serving to cement the lamp plate to the neck, the lamp plate being in the form of a generally annular disc whose inner edge engages the periphery of the lamp bulb in a gas-tight manner and whose outer edge extends substantially axially and projects into said resin compound, the lugs on the ring gripping around the rear of the lamp plate. If manufacturing processes are specified which do not permit a welding to the surface-treated reflector, it is possible for the lamp plate to be constructed s a glass plate whose periphery has an axially directed portion having a U-shaped annular groove therein which receives a sealing compound, serving to cement the lamp plate to the neck, the reflector neck extending into the sealing compound to effect said gas-tight connection.

If the reflector has not got a neck, a gas-tight connection between the glass plate and the reflector may still be achieved if a holder ring of S-shaped cross-section forms the reflector neck, one loop of the ring embracing the reflector and its other loop gripping the peripheral edge of the glass lamp plate, the reflector and the glass plate being cemented to the ring and thus to each other by a sealing medium.

If a gas-tight halogen bulb whose socket is sealed gas-tight by a socket plug is available, it has been found appropriate for the socket to be received in tightly fitting relationship by the neck and by a plastics sleeve serving as the lamp plate and surrounding both the rear end of the socket and the socket plug.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:- Figure 1 is a general, cross-sectional view of a sealed beam headlamp in accordance with the invention;

Figure 2 is a section through part of a first embodiment of headlamp in accordance with the present invention;

Figure 3 is a sectional detail view of a modified version of the embodiment of Figure 2;

Figure 4 is a section through part of a second embodiment of headlamp in accordance with the present invention;

Figure 5 is a sectional detail view of a modified version of the embodiment of Figure 4;

Figure 6 is a section through part of a third embodiment of headlamp in accordance with the present invention;

Figure 7 is a section through part of a fourth embodiment of headlamp in accordance with the invention; and

Figure 8 is a section through part of a fifth embodiment of headlamp in accordance with the invention.

The sealed beam headlamp 10 of Figure 1 has an optical axis 0-0 and comprises a reflector 11 of sheet-metal, the light output opening of which has a radial and axial bend 12 into which is cemented the edge 13 of a diffusing lens 14. A cylindrical neck 15 is formed on the reflector 11 in the region of the vertex aperture, the neck 15 enclosing a lamp plate 16 drawn from sheet metal. The plate 16 carries on its inside a lamp bulb 17 having a double filament incandescent coil 18. The dish 16 also carries a cross-piece 19 of a beam cover plate 20 for partially screening directly emitted light.

In the first embodiment shown in section in Figure 2, the reflector 11, with its neck 15 extending parallel to the optical axis 0-0, receives the lamp plate 16. The plate 16, which is made of drawn sheet, comprises a base portion 21 formed with three bulge-like apertures 22 therein, an annular side portion 23 which is connected to a peripheral ring portion 25 bent over in a direction towards the rear of the reflector 11, and a radially extending flange portion 24. The rearward edge of the neck 15 is welded to the edge of the ring 25, so that a circumferential welded

seam 26 is formed. A socket 28, also drawn from sheet-metal, has a flange 29 which bears against the flange portion 24 of the plate 16 and a central portion in the form of a funnel 30. The flange 29 is preferably welded to the flange portion 24 of the plate 11. The double-filament incandescent lamp 18 is a special form of halogen lamp and comprises a hermetically sealed bulb 17 having a portion 32 which is squeezed flat and is held by cement 33 in the funnel 30. Three electrodes 34 emerge from the flat portion 32 which each pass through a respective one of said apertures 22 and each of which carries a length of tubing 35 in the region of the base 21 of the plate 16 each length of tubing being sealed in its associated aperture 22 by a respective mass of fused glass 36. A respective L-shaped connector lug 37 is mounted with its short arm 38 on the end of one of the lengths of tubing 35 and firmly attached thereto, as well as to the electrode passing therethrough, preferably by means of solder.

The cross-piece 19 of the beam cover plate 20 (Figure 1) is welded to the socket 28. The welding seam 26 between the reflector 11 and the lamp plate 16 must be continuous, so that the interior of the reflector 27 is sealed in a gas-tight manner. An alternative embodiment is shown in Figure 3 where the ring portion 40 of the lamp plate 41 is flanged at 42 to form an annular groove between itself and the neck 15, into which is inserted an 0-ring 43, so that a seal is also achieved with the neck 15 of the reflector 11. The lamp plate 41 and the reflector 11 need then be joined to one another only at a few points by soldering or welding. In this embodiment it is preferred if the socket 28 extends into the region of said annular groove, thereby forming a U-shaped accommodation for the 0-ring 43, so that the latter is retained against axial displacement and the axial contact pressure of the 0-ring is further increased.

In the second embodiment shown in Figure 4 the socket comprises a ceramic body 45 formed with a hollow annular side portion 46 and a base 47 having a cutout portion 48. The flat portion 32 of the two-filament incandescent lamp 18 is held by cement 33, the three electrodes 49 extending through the cut-out portion in the base 47. The lamp plate is in the form of a glass plate 50 having a flat base portion 51 and an annular edge portion 52 formed with a U-shaped annular groove 53. The reflector neck 15 rests against the inside 54 of the groove 53, the groove 53 being substantially filled by a synthetic resin 55. The resin 55 is effective to form a gas-tight seal between the neck 15 and the plate 50. Three stepwise tapering caps 56 are fused into the base 51 of the glass plate 50. An annular portion 58 of a respective lug 57 is slid over each cap 56 and soldered on at 59.

Three plates 60 are attached to the ceramic socket 45 in line with its base 47. A pin 61, preferably having an angular cross-section is fixed by a respective tubular rivet 62 to each plate 60, each pin 62 projecting from a respective one of the caps 56 to which it is soldered. In this embodiment, each electrode 49 is in conductive connection with a respective pin 61 at a junction 63. The cross-piece 19 of the screening cap 20 (Figure 1) is likewise attached to the plate 60 by the tubular rivet 62.

A different manner of attachment of a glass plate 64 to a reflector 65 is illustrated in Figure 5, where the reflector neck is formed by a retaining ring 67 of generally S-shaped cross-section. A gas-tight joint is achieved by the ring 67 whose smaller loop 68 holds the reflector 65. The annular chambers 70 and 71 formed by the loops of the ring 67 are filled with an adhesive compound, preferably silicon rubber, or else with 0-rings, which seals the reflector 65 relative to the glass plate 64.

Figure 6 illustrates a third embodiment using a halogen lamp, the bulb 75 and lugs 77 of which are inserted in a lamp socket 76, a lamp plate 78 being in tight contact with the peripheral surface of the socket 76. The lamp plate is bent in swan-necked form, as viewed in cross-section, in such a way that a rim 79 thereof extends substantially axially. The neck 15 of the reflector 11 supports a flanged ring 80 which is pressed over punched points 81 onto the reflector 11 and so forms an annular trough into which is poured a synthetic resin 55. A cross-piece 82, notched out from the reflector neck 15, engages a trough 83 when the light-bulb is inserted, by virtue of which a correct co-ordination of the lamp with the reflector is achieved. The whole circumference of the rim 79 extends into the synthetic resin 55 and thus provides a seal between the lamp plate 78 and the reflector 11. Three lugs 84 project from the flange ring 80, which lugs 84, after the incandescent lamp has been inserted, are bent into the position shown, and thus grip the lamp plate 78 to maintain its fixed position on the reflector neck 15.

In the arrangement of Figure 7, the reflector 11 supports a halogen lamp by means of its neck 15, the bulb portion 32 of the lamp being cemented into a socket 85 closed at its rearward end by a socket plug 86. As before, respective connector lugs 37 are connected to the electrodes 34 by soldering. The socket 85 is provided with an outwardly extending fixing lug 87 which engages in a recess of the reflector neck 15 and so fixes the incandescent lamp in the reflector 11. Furthermore, the three ears 88 project from the shell of the socket plug for

determining the axial position of the socket 85. When the lamp is inserted, the socket 85 is fixed in its predetermined position with respect to the optical axis 0-0 and a plastics sleeve 89 acting as a lamp plate is subsequently moulded around it, so that a lasting and fixed connection with the reflector is achieved. To ensure a thorough interengagement of the sleeve 89 and the reflector neck 15, several slots 90 are punched out of the neck into which plastics material is also injected during the manufacture of the sleeve.

A further manner of accomplishing a gas tight connection between the incandescent bulb and the reflector 11 is illustrated in Figure 8 where the bulb 17, or the flat portion 32 thereof, is held by a cap 92 which in turn is fitted on a sleeve-like socket 93, the rear portion of which is closed by a plate 94. A bush 95 for each electrode 34 is moulded into the latter plate, each bush 95 holding in its bore a respective electrode 34 and on its collar 96 a connector lug 37. In the vertex region of the reflector 11, in addition to the neck 15, a truncated cone section 97 is formed. A tin-plated annular sleeve 98 acting as a lamp plate, which in its original state has a cylindrical and a flange-shaped part, is slid from the rear into the reflector neck 15 and is then rolled-in in such a manner that it rests flush against the neck 15 and against the truncated cone section 97. The annular sleeve is then heated inductively, so that the tin-plating melts an enters into a tight joint with the socket 93. If necessary solder may be additionally applied. A tension ring 101 has a loop-like projection 103 into which is inserted a cross-piece 19, the end portion of the ring 101 reaching almost to the annular sleeve 98. The lamp bulb 17 thus centred is sealed on its socket 93 with respect to the reflector 11 by adhesive compound 100 poured into the wedge-shaped throat 99, which additionally retains the cross-piece 19, whose end portion extends into the compound 100.

WHAT WE CLAIM IS:-

1. A sealed beam headlamp for a motor vehicle comprising a metal reflector with a diffusing lens attached thereto, the vertex region of the reflector containing an opening in which the bulb of a sealed halogen lamp is fixed by means of a socket and a lamp plate, in such a manner that the lamp is non-releasably, as herein defined, and hermetically sealed within the reflector, the lamp plate being welded, soldered, or cemented to or being moulded onto the rim of the opening.

2. A headlamp as claimed in claim 1, in which the lamp has a flattened bulb portion from which the lamp electrodes emerge, the lamp electrodes extending through said lamp plate in a gas-tight manner and the flattened bulb portion being held in the socket by means of a cement.

3. A headlamp as claimed in claim 2 in which the socket is formed from sheet-metal and comprises a flange portion attached to the lamp plate and a funnel portion which receives the flattened bulb portion and the cement holding the bulb portion in the socket.

4. A headlamp as claimed in any of claims 1 to 3 in which said lamp plate is formed of sheet metal and comprises a flanged portion bearing an axially extending ring portion which is tightly sealed by a circumferential welded seam to a substantially axially directed neck of the reflector.

5. A headlamp as claimed in any of claims 1 to 3, in which said lamp plate is formed of sheet metal and comprises a flanged portion bearing an axially extending ring portion the ring portion having a recess therein which receives an O-ring serving as said sealing means, a substantially axially directed neck of the reflector being connected to the ring portion by several soldering or welding joints.

6. A headlamp as claimed in any of claims 1 to 5, in which said lamp plate has a base having a respective aperture therethrough for each electrode of the lamp into which a length of tubing is sealed by means of fused glass, each length of tubing being joined by a soldered joint to the electrode passing through it.

7. A headlamp as claimed in claim 1, in which a ring having an inwardly directed flange on one axial end and a number of inwardly directed lugs on its other end engages over a substantially axially directed neck of the reflector, the annular trough thereby formed between the ring and the reflector neck receiving a synthetic resin compound which cements the lamp plate to the neck, said lamp plate being in the form of a generally annular disc whose inner edge engages the periphery of the lamp bulb in a gas-tight manner and whose outer edge extends substantially axially and projects into said resin compound, the lugs on the ring gripping around the rear of the lamp plate.

8. A headlamp as claimed in claim 1 in which said lamp plate is constructed as a glass plate whose periphery has an axially directed portion having a U-shaped annular groove therein which receives a sealing compound cementing the lamp plate to a substantially axially directed neck of the reflector, the neck extending into the sealing compound to effect a gas-tight connection.

9. A headlamp as claimed in claim 8 in which said sealing compound is a synthetic resin and the reflector neck is centred by engagement with the radially inner surface of said U-shaped groove.

10. A headlamp as claimed in claim 1 in which said lamp plate is constructed as a glass plate and in which one loop of a holder ring of S-shaped cross-section embraces the reflector, the other loop gripping the peripheral edge of the glass lamp plate, and the reflector and the glass plate being cemented to the holder ring and thus to each other by a sealing medium.

11. A headlamp as claimed in claim 10 in which the sealing medium is a silicon rubber.

12. A headlamp as claimed in any of claims 8 to 11, in which the glass lamp plate has a respective aperture therethrough for each electrode and a respective cap fused to it, to which are soldered the associated electrode and a respective connector lug.

13. A headlamp as claimed in any of claims 8 to 12, in which the socket is in the form of a pot-shaped ceramic body the base of which has a cutout for the passage of the electrodes therethrough.

14. A headlamp as claimed in claim 1, in which the rear of the socket is sealed by a socket plug, the socket being received in tightly fitting relationship by a substantially axially directed neck of the reflector, and in which a plastics sleeve serving as the lamp plate surrounds both the rear end of the socket and the socket plug.

15. A headlamp as claimed in claim 14 in which the socket has an outwardly directed fixing lug which engages a notch on a substantially axially directed neck of the reflector and a plurality of ears project from the socket plug for fixing the axial position of the socket, the neck being formed with a plurality of axially directed slots in the rearward end thereof.

16. A headlamp as claimed in claim 1, in which the reflector is formed with a frusto-conical portion in its vertex region and in which an annular sleeve, serving as said lamp plate is inserted into the neck and is soldered to the socket, the wedge-shaped annular space so formed between the socket and the neck being filled with an adhesive compound to seal the socket to the reflector.

17. A headlamp as claimed in claim 16, in which a cross-piece of a cover plate for the bulb is inserted in a tension ring, one end portion of which extends into said adhesive compound in the wedge-shaped annular space.

18. A headlamp constructed substantially as hereinbefore particularly described with reference to and as illustrated in Figure 1 of the accompanying drawings.

19. A headlamp constructed substantially as hereinbefore particularly described with reference to and as illustrated in Figure 2 of the accompanying drawings.

20. A headlamp as claimed in claim 18 when modified substantially as hereinbefore particularly described with reference to and as illustrated in Figure 3 of the accompanying drawings.

21. A headlamp constructed substantially as hereinbefore particularly described with reference to and as illustrated in Figure 4 of the accompanying drawings.

22. A headlamp as claimed in claim 21 when modified substantially as hereinbefore particularly described with reference to and as illustrated in Figure 5 of the accompanying drawings.

23. A headlamp constructed substantially as hereinbefore particularly described with reference to and as illustrated in Figure 6 of the accompanying drawings.

24. A headlamp constructed substantially as hereinbefore particularly described with reference to and as illustrated in Figure 7 of the accompanying drawings.

25. A headlamp constructed substantially as hereinbefore particularly described with reference to and as illustrated in Figure 8 of the accompanying drawings.

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1442422 COMPLETE SPECIFICATION
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Sheet 1

Fig. 1

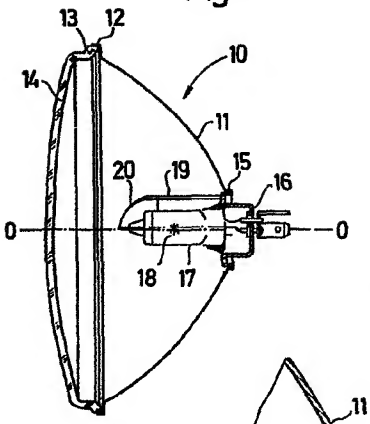

Fig. 3

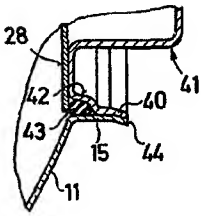

Fig. 2

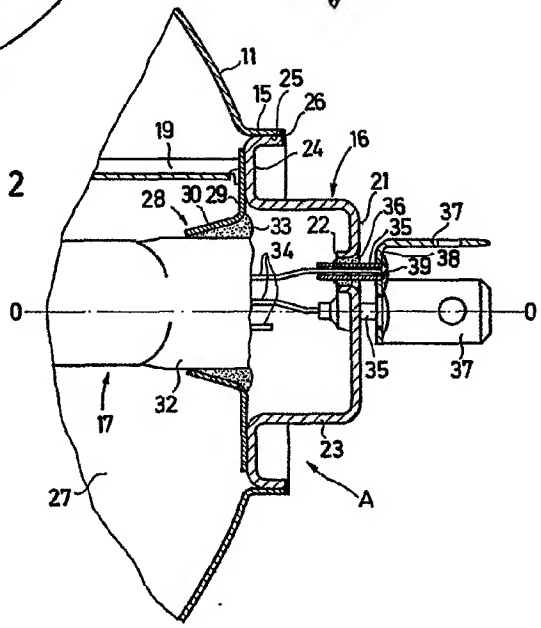

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Fig. 4

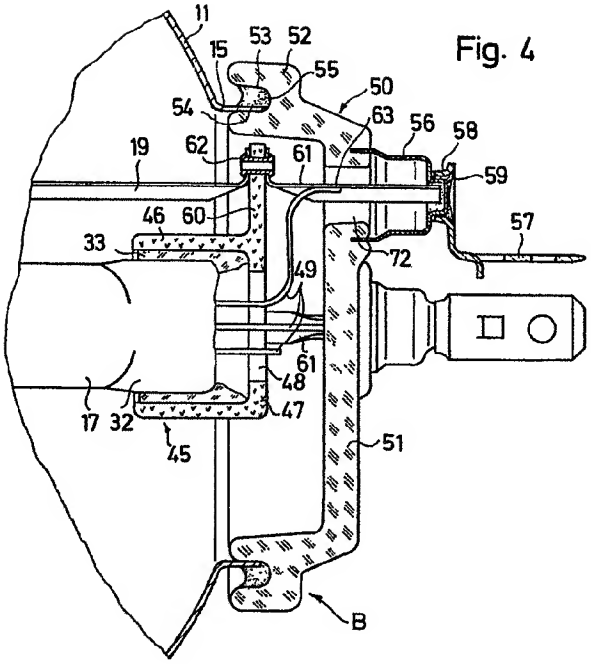
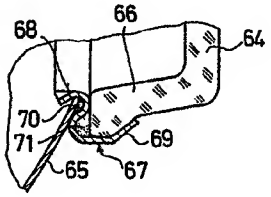


Fig. 5



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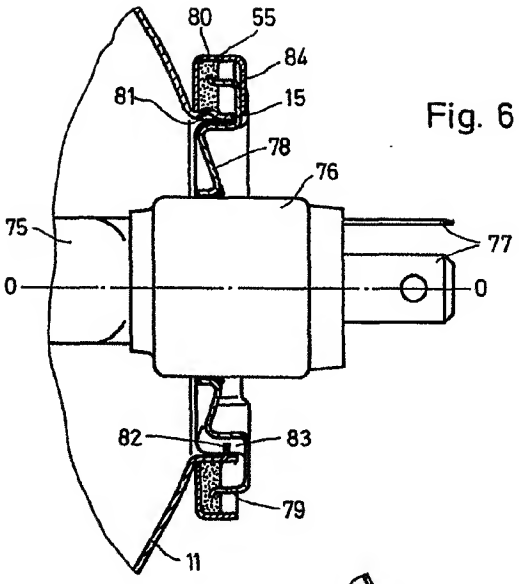

Fig. 6

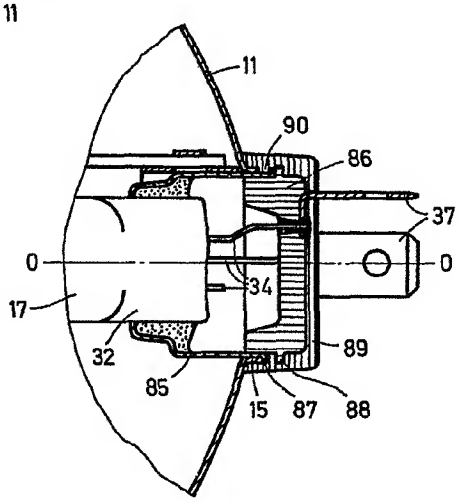

Fig. 7

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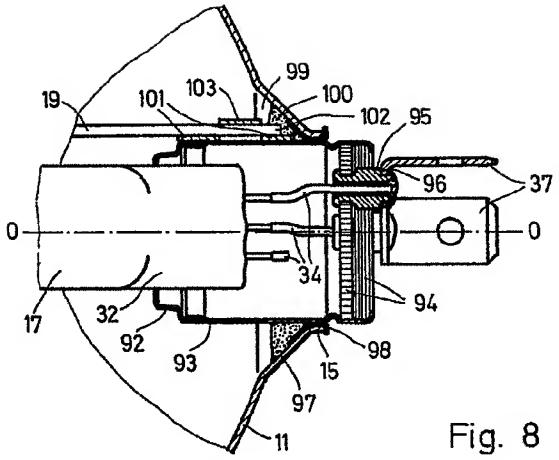

Fig. 8

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(54) **Replaceable lamp unit and automobile headlight utilizing same.**

(57) A lamp unit (10) for being removably positioned within the rear opening (11) of an automobile headlight reflector (13). The unit (10) includes a plastic holder (19), an electric (e.g., tungsten halogen) lamp (30) having a filament structure (42) contained within the envelope (33) thereof, a clamp member (46) secured to the lamp's press-sealed end portion (47), and an insert member (48) located within a cavity (21) of the holder (19). The clamp member (46) includes a pair of skirt portions (57) which frictional engage and are thereafter secured (e.g., welded) to the innermost surface of an upstanding portion (61) of the insert member (48), thus facilitating alignment and positioning of the lamp (30) relative to the holder (19). The insert member (48) is only partly inserted within the holder's cavity (21) to effect the defined securement and is thereafter attached to the holder.

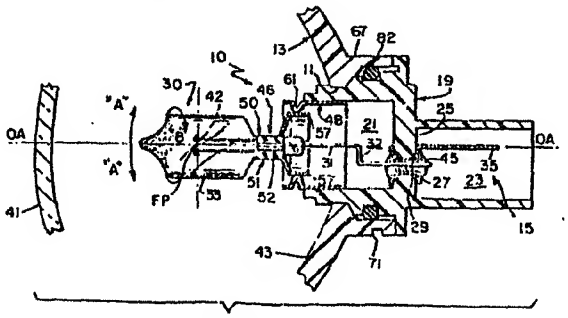

FIG.2

EP 0 188 260 A2

REPLACEABLE LAMP UNIT AND AUTOMOBILE HEADLIGHT UTILIZING SAME

TECHNICAL FIELD

The invention relates to automobile headlights and more particularly to those wherein a replaceable lamp unit assembly is utilized.

BACKGROUND

Automobile headlights wherein a replaceable lamp unit is employed are known in the art. Examples are illustrated in the below-identified patents:

2,423,664	E. RYDER
2,750,491	H.J. ANDERSON
3,593,017	P. CIBIE
3,688,103	H. DAUMULLER
3,917,939	H.J. SCHMIDT ET AL
3,987,326	G. LINDAE
4,342,142	Y. NEIDA ET AL
4,344,119	T. BERGOT
4,412,273	P. HELBIG ET AL

As stated, the instant invention is related to lamps of the variety described above. In particular, the invention defines a replaceable lamp unit which provides both a hermetic seal for the unit within the headlight's reflector and, equally important, assures that the electric lamp utilized therewith will be maintained in strict alignment as is necessary in

automotive headlights. By the term hermetic seal is meant a seal which prevents the passage of moisture, dust and other elements which can adversely affect the operation of the headlight. By way of example, excessive moisture entering the headlight can adversely affect the reflective coating typically utilized on the concave reflector of the headlight, and thus significantly reduce light output.

In addition to providing a hermetic seal, the replaceable lamp unit defined herein assures that alignment of the electric lamp employed therewith will be maintained. That is, alignment of the glass envelope of the lamp relative to the unit's holder is provided such that the filament structure within the envelope (either a singular coiled filament or two, spaced coiled filaments) will be accurately aligned relative to the optical axis of the reflector when the lamp unit is oriented within the reflector's rear opening. Such alignment is deemed critical to assure optimum headlight output in the direction(s) desired.

As also described herein, a preferred light source which constitutes an important part of the replaceable lamp unit defined herein is an electric lamp of the tungsten halogen variety. One example is shown in U.S. Patent 3,829,719 (Westlund, Jr. et al), said patent assigned to the same assignee as the instant invention. In tungsten halogen lamps, the tungsten which constitutes the filament material is normally evaporated from the filament during lamp operation and combines with the halogen to form a gaseous halide, the halide preventing the tungsten from depositing on the internal wall of the lamp's glass envelope. Upon returning to the filament structure, the halide decomposes, resulting in the deposition of tungsten back onto the filament structure and the release of additional halogen gas to assure continuation of the cycle.

The halogen cycle is well known in the art and lamps employing it have been used for some time. In the case of the two beam (dual filament) lamp, a typical tungsten halogen lamp provides about 65 watts when operated at high beam and about 35 watts at low beam. As stated, it is critical that the filament structure of the lamp within an automobile headlight be aligned relative to the reflector to provide optimum output of the finished headlight. As will be described below, such alignment constitutes an important feature of the replaceable lamp unit defined herein.

DISCLOSURE OF THE INVENTION

It is an object of the instant invention to enhance the automobile headlight art and, more particularly, to enhance that portion of the art wherein replaceable units that employ electric lamps are utilized.

It is another object of the invention to provide a replaceable lamp unit for use within an automobile headlight which provides a hermetic seal for the electric lamp positioned therein and also maintains the lamp in a fixed, precisioned relationship relative to the holder thereof such that the lamp is precisely oriented relative to the headlight's reflector when the unit is located therein.

It is another object of the invention to provide such a replaceable lamp unit which can be inexpensively produced in a manner readily adapted to mass production.

In accordance with one aspect of the invention, there is defined an improved lamp unit capable of being removably positioned within the rear opening of a reflector which constitutes part of an automobile headlight. The lamp unit is

designed for being electrically connected to an external connector which forms part of the electrical circuitry of the automobile. The lamp unit includes an electrically insulative holder defining a cavity therein and an electric lamp positioned within the holder and which includes an envelope having a filament structure therein for being oriented within the reflector when the holder is located within the reflector's rear opening. The lamp unit also includes at least two electrically conductive lead-in wires projecting from the envelope. The improvement comprises a clamp member which is secured about the envelope at a precise location relative to the filament structure and an insert member located at a predetermined distance within the holder's cavity. The clamp member is partly inserted within the insert in contact with an upstanding portion thereof and secured (e.g., welded) to the upstanding portion such that the filament structure will be precisely oriented relative to said reflector.

In accordance with another aspect of the invention, there is defined an improved automobile headlight which includes a concave reflector (glass or plastic) including a rear opening therein, a front lens for directing light emitted from the electric lamp of the headlight and reflected by the reflector, and a lamp unit adapted for being removably positioned within the concave reflector's rear opening. The lamp unit includes an insulative holder for being positioned within the rear opening and defines a cavity therein. The headlight further includes an electric lamp positioned within the holder and including an envelope and at least two electrically conductive lead-in wires projecting from the envelope. The improvement comprises a clamp member which is secured about the envelope at a precise location relative to the filament structure and an insert member located a predetermined distance within the holder's cavity. The clamp member is partly inserted within

the insert and secured (e.g., welded) to an upstanding surface therein such that the filament structure will be precisely oriented relative to the reflector.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 represents an exploded perspective view of the electric lamp, clamp member and insert member of a lamp unit in accordance with a preferred embodiment of the invention;

FIG. 2 is a side elevational view, in section, of the lamp unit of the invention and further illustrating the reflector and lens members of a preferred embodiment of an automobile headlight of the invention; and

FIG. 3 is a partial, side elevational view on a larger scale of the clamp member and electric lamp of the invention, illustrating particularly the positioning relationship of the clamp member on the sealed end of the electric lamp.

BEST MODE FOR CARRYING OUT THE INVENTION

For a better understanding of the present invention, together with other and further objects, advantages and capabilities thereof, reference is made to the following disclosure and appended claims in connection with the above-described drawing.

With particular attention to FIG. 1, there is illustrated in a perspective view several components which form part of a lamp unit 10 (FIG. 2) capable of being removably positioned within the rear opening 11 of a reflector 13 which forms part of an automobile headlight. Lamp unit 10 is further designed for being electrically connected to an external connector (not

shown) which comprises part of the electrical circuitry of the automobile using the headlight. Specifically, this external connector is designed for being inserted within the rear portion 15 of unit 10 after unit 10 has been positioned within the reflector's opening. Such a connector typically includes a plurality of electrical wires which also form part of the automobile's circuit. These wires are thus either directly or indirectly connected to the power source (e.g., 6- or 12-volt battery) typically found in most automobiles.

Unit 10 includes an electrically insulative holder 19 which defines therein a first cavity 21 and a second cavity 23, said cavities separated by a common wall member 25. Holder 19 is comprised of a heat and impact resistant plastic (e.g., polyphenylene sulfide) and is thus readily suited for use within the relatively harsh environments typically found about automobile headlights.

Unit 10 preferably further includes at least two (only one being shown) electrically conductive members 27 which are each fixedly secured within a respective one of a similar number of apertures 29 (one shown in FIG. 2) located within wall member 25. It is understood that a minimum of two apertures and corresponding electrically conductive members 27 are to be utilized in the instant invention. In the embodiment depicted herein, three members 27 (and apertures 29) are utilized because holder 19 accommodates a dual filament, tungsten halogen lamp 30. Typically, tungsten halogen lamps which include a dual coil filament structure 42 therein (such as shown in FIGS. 1 and 2) in turn include at least four lead-in wires 31 (only one being shown in FIG. 2) which project externally from the glass envelope 33 of the lamp. In the case of a single coil tungsten filament lamp, only two lead-in wires are typically utilized. It is thus understood with regard to

the invention, that holder 19 is adapted for accommodating both single and double coil filament tungsten halogen lamps.

Each of the electrically conductive members 27 is preferably in the form of a conical shaped metal eyelet. A preferred material for each eyelet is tin-plated brass. Other suitable metals include aluminum, copper, steel, and nickel-iron alloy.

Electrically connected to each eyelet is a metallic lug member 35 which includes a base segment positioned firmly against wall 25 and an upstanding leg segment which extends within second cavity 23. Accordingly, each of the lug members 35 (understandably, a total of three are used in the embodiment shown in the drawing) is designed for being inserted within a corresponding opening of the aforementioned external connector to provide electrical connection therewith when the connector is inserted within cavity 23.

As stated, holder 19 is adapted for accommodating an electric lamp 30 which is preferably of the tungsten halogen variety. When in final position within opening 11 of reflector 13, the envelope 33 of lamp 30 extends within the reflector and is substantially surrounded by the reflecting surfaces 43 thereof in such a manner so as to provide optimum light output from the headlight. The headlight further includes the forward lens member 41 secured to reflector 13 and designed for directing light in a predetermined pattern from the assembled unit. Understandably, alignment of envelope 33 and particularly the filament structure 42 contained therein relative to the internal reflective surfaces 43 of reflector 13 such that filament structure 42 is precisely oriented (i.e., centered on) relative to the reflector's optical axis OA-OA and, equally important, the reflector's focal point FP, is deemed critical to assure optimum light output. Accordingly,

it is essential that lamp 30 be initially precisely oriented relative to holder 19 in a fixed relationship therewith such that when the holder is finally positioned within opening 11 this critical alignment is attained. Such precisioned alignment constitutes an important feature of the instant invention, in addition to the provision of the aforementioned hermetic seal.

In FIG. 2, the lead-in wires 31 are shown projecting from envelope 33 into the first cavity 21 of holder 19. Each lead-in wire 31 is shaped such that it will pass through a respective one of the metallic eyelets 27. As shown, each wire includes a substantially centrally located offset segment 32 to enable this positioning. There is thus no need for additional support wires or the like herein. It should also be mentioned that in a dual filament lamp where four lead-in wires are utilized, only three wires are designed to pass through and be connected to a corresponding eyelet. Accordingly, two wires 31 are joined (welded) to serve as a common lead. The arrangement is illustrated clearly in FIG. 1. Attachment of each lead-in wire 31 to a respective one of the conductive eyelets is achieved by soldering such that a quantity of solder 45 flows within the hollow eyelet and effectively surrounds the support wire centrally disposed therein. One example of a suitable solder for use in the invention is a 30/70 tin-lead composition. Other suitable compositions include a 60/40 tin-lead composition, and a 20/80 tin-lead composition. The solder, in addition to providing a sound electrical connection between the eyelet and lead-in wire, also assures the defined hermeticity at this portion of the connection by virtue of its complete filling of the illustrated end portion of the eyelet. It also serves to rigidly maintain the lead-in wire in a fixed

position relative to holder 19 such that the corresponding lamp 30 will be maintained in the substantially fixed position shown. Positive positioning of the lamp is thus assured.

To provide effective connection between the respective lug members 35 and corresponding conductive eyelets 27, a mechanical operation is utilized. Specifically, a projecting end segment of each of the metallic eyelets is crimped over the leg portion of the respective lug member which rests against wall 25. Because the eyelet includes a flange portion at the opposing end thereof (against an opposing surface of wall 25), this crimping operation in effect draws the eyelet positively within the corresponding conical-shaped aperture. The result, therefore, is that a seal is provided between each eyelet and corresponding aperture. The defined crimping operation, as stated, functions to provide the essential electrical connection between lug and eyelet components.

In accordance with the teachings of the instant invention, lamp unit 10 further includes an improved means for providing precisioned alignment of the lamp's envelope (and contained filament structure) within the holder member. More specifically, the invention provides a means for precisely orienting the lamp's envelope in at least three directions relative to the locating surfaces of the holder which align with and engage the reflector when the holder is in final position within the reflector. This three-way orientation prior to final securement of the lamp, including securement of the aforementioned lug and eyelet components, not only assures such precise alignment but, as explained below, is readily adaptable to mass production techniques.

To accomplish this, unit 10 includes a clamp member 46 which is secured about the press-sealed end portion 47 of envelope 33 at a precise location relative to the contained filament structure 42. In addition, unit 10 further includes

an insert member 48 which is designed for being partly positioned a predetermined distance within cavity 21 of holder 19. Both member 48 and cavity 21 are of substantially cylindrical shape to facilitate such insertion. In addition, the clamp and insert members are both preferably comprised of steel (i.e., stainless steel), having a thickness of only about 0.016 inch. Clamp member 46 is of two-part construction, comprising two opposing, substantially similar side elements 50 and 51 which, in assembly, are each positioned against an opposing side of the relatively flat end portion 47 such that end tabs 52 thereof become aligned and contact each other. A weld is then performed to connect both opposing pairs of tabs. Precise alignment of each side element is achieved by the provision of two upstanding segments 54 on each opposing side (only two shown in FIG. 1) of sealed end portion 47 and a corresponding number of similarly shaped openings 55 within each side element. Understandably, the upstanding segments, which align with and are inserted within these openings, are precisely located at the time of pressing end portion 47. As is known in the art, press-sealing of a tungsten-halogen lamp envelope typically occurs only after the lamp's filament structure has been inserted to a prescribed depth within the glass tubing which eventually forms the lamp's envelope. This positioning relationship is best illustrated in FIG. 3. It is thus seen that clamp member 46 is accurately located relative to the filament structure 42. As also shown in the drawings, and in particular FIGS. 1 and 3, each part 50, 51 of clamp member 46 includes a skirt portion 57 of substantially semi-circular configuration and designed to be inserted within a large, centrally disposed opening 60 defined by insert 48. Specifically, the outer edge of each skirt engages and slides over the uppermost surface of an upstanding (constricting) portion 61 formed within the outer wall of insert 48 and

projecting therein (within opening 60). Portion 61 extends about the entire inner periphery of insert 48 and is thus also of semi-circular shape to in turn define a smaller diameter opening therein than opening 60. To enable minor contraction of the skirt portions 57 during frictional engagement with upstanding portion 61, a pair of slots 62 are provided by spacing these portions a small distance apart. It is also seen in FIG. 1 that insert 48 has a slot 63 therein to enable minor contraction thereof during positioning within holder 19, thereby facilitating such positioning.

Skirt portion 57 and the outermost surface of portion 61 are both of similar configuration (see especially FIG. 1) to facilitate this engagement and, particularly, to facilitate alignment therebetween. This configuration, as defined, is preferably substantially circular (cylindrical). After initial frictional engagement between these elements, lamp 30 and clamp member 46 are further inserted until filament 42 occupies a predetermined depth. This is considered the first of the aforementioned three directions of orientation. Lamp 30 and clamp member 46 are then moved in a side-to-side direction ("A" in FIG. 2) until the filament structure is substantially centered. Simultaneously with this movement, the envelope 33 may be rotated ("B" in FIG. 2) to precisely orient the coiled filament structure in this manner. At all times, the skirt portions 57 maintain contact with the innermost surface of portion 61. When proper orientation is achieved (i.e., as determined by camera inspection), skirt portions 57 are welded to portion 61 at spaced locations therealong. Laser welders are used because these devices can be accurately aimed and triggered from a distance, thus not interfering with other components of the overall machine which provides assembly of the invention. To enable such usage, the insert member 48 is located within holder 19 such that the upstanding portion 61

protrudes externally of the holder. All welds, preferably three or four at equidistant spacings, are thus achieved externally of holder 19. In addition, such welding occurs only at these locations, there being no further connections or other forms of attachment between the insert and clamp members. This feature significantly reduces production times and associated costs for the invention.

Insert member 48, being metallic, is securedly positioned within the plastic holder 19 using RF induction heating. That is, member 48 is heated to the point that softening of the inner walls of the holder occurs with said material thereafter permanently adhering to the insert. Filament structure 42 has thus been precisely oriented within unit 10 relative to the aforementioned referencing surfaces of holder 19. During this orientation, the three lead-in wires 31 were inserted within the respective eyelets 27 which in turn were only loosely positioned within their respective apertures 29. After all of the above precise aligning has occurred, including fixed securement (welding) of the clamp and insert members, the lug members 35 are then secured to the respective eyelets using a crimping operation. The defined solder 45 is then applied and a substantially assembled unit 10 is ready for insertion within reflector 13.

With further regard to the invention, it is understood that the side-to-side movement of envelope 33 can also include movement toward and away from the viewer in FIG. 2, or various alternative directions if desired, in place of or even in addition to that depicted by arrow "A". It is believed, however, that the extreme precision provided by the invention can be attained with only the three types of movement described above.

A significant feature of the instant invention is that not only has precisioned alignment been achieved in a highly expeditious manner but such alignment is achieved without the need for cement or the like. Curing time for this material would add appreciably to the overall assembly of such a unit. In addition, cements of this type typically outgas at elevated temperatures, such gas possibly adversely affecting the finished product (e.g., by affecting the internal reflective surfaces of the headlight's reflector. The lamp unit of the instant invention overcomes both of these deleterious occurrences.

As also shown in FIG. 2, reflector 13 includes a projecting neck portion 67 which extends from the rear portion of the reflector and is located about opening 11 (that is, opening 11 extends through the circumferential neck 67). Located within the exterior surfaces of neck portion 67 is at least one groove 71. To further assist in retaining holder 19 within opening 11, a removable cap member (not shown) is utilized. This cap is adapted for being positioned within (engaging) the corresponding groove 71 and can include a resilient base segment designed for engaging an external surface of holder 19. Such a base segment is preferably resilient to allow flexure thereof during engagement with the holder to prevent lamp misalignment as a result of said engagement. Positioning of holder 19 within reflector 13 is accomplished merely by aligning corresponding slots (not shown) within the external surface of the holder with corresponding male protuberances or the like (not shown) which are spacedly located about the reflector opening 11. Holder 19, having lamp 30 fixedly and precisely positioned therein in the manner defined above, is thus merely inserted within reflector 13 to the depth indicated in FIG. 2. There is thus no need for rotational-type movement

of the holder in order to secure its final position within reflector 13. Thereafter, the aforedescribed cap member, preferably including a large central orifice adapted for passing over the exterior surfaces of the rear portion of holder 19, is simply screwed onto the upstanding neck portion 67 of reflector 13. Retention of this cap is preferably assured by provision of an upstanding flange on holder 19. A similar number of projecting segments (not shown) which form part of the cap are designed for passing through various recesses after which the cap is rotated a short distance to effect locking.

To further assure a sound hermetic seal between the exterior surfaces of holder 19 and the corresponding internal surface of opening 11, a rubber O-ring 82 is provided. As shown in FIG. 2, O-ring 82 is positioned within a corresponding groove or slot within the holder's external surface and projects slightly thereabove. Accordingly, a compression fit is provided between the outermost edge of the O-ring and the corresponding internal surfaces of holder 19.

There has thus been shown and described a replaceable lamp unit for use within an automobile headlight wherein the unit provides both a hermetic seal between the electric lamp used therein and the holder, in addition to an effective means of precisely aligning the lamp in fixed relationship to the holder. As shown in FIG. 2, an automobile headlight capable of using replaceable lamp unit 10 includes the concave reflector 13 and the corresponding front lens member 41 which may be sealed to the reflector in any manner known in the art. It is also within the scope of the invention to utilize a reflector and lens which constitute an integral unit, thus eliminating the need for a seal therebetween. Suitable materials for the

reflector and lens are glass and plastic (e.g., polycarbonate). With lamp unit 10 in position within reflector 13, the filament structure of the electric lamp used therein is precisely oriented relative to the reflective surfaces of the reflector, and the focal point and optical axis thereof. Should the lamp fail (burn out), replacement is readily achieved by removing the external connector and retaining cap member, withdrawing the holder and contained lamp, and thereafter directly inserting a new holder-lamp assembly. The retaining cap and external connector are then located in place.

While there have been shown and described what are at present considered the preferred embodiments of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the scope of the invention as defined by the appended claims.

CLAIMS

WHAT IS CLAIMED IS:

1. In a lamp unit for being removably positioned within an opening within the rear portion of an automobile headlight reflector wherein said lamp unit includes an electrically insulative holder for being positioned within said opening and defining a cavity therein and an electric lamp adapted for being positioned within said holder, said lamp including an envelope having a filament structure therein and at least two lead-in wires projecting from said envelope, said filament structure being oriented within said reflector of said automobile headlight when said holder is positioned within said opening, the improvement comprising:

a clamp member secured about said envelope of said electric lamp at a precise location relative to said filament structure; and

an insert member partly inserted a predetermined distance within said cavity of said insulative holder and defining an opening therein, said insert member having an upstanding portion extending within said opening, said clamp member being positioned within said opening within said insert member in contact with said upstanding portion and fixedly secured only to said upstanding portion such that said filament structure will be oriented within said reflector in a precise manner relative thereto when said insulative holder is positioned within said reflector opening.

2. The improvement according to Claim 1 wherein said clamp member is of two-part construction and said envelope of said electric lamp includes a pressed end portion, said clamp member being secured about said end portion.

3. The improvement according to Claim 2 wherein each of said two parts are located about said pressed end portion and thereafter secured to each other.

4. The improvement according to Claim 2 wherein said pressed end portion of said envelope includes at least one upstanding segment thereon and said clamp member includes at least one opening therein, said upstanding segment being located within said opening to thereby assist in orienting said clamp member at said precise location relative to said filament structure.

5. The improvement according to Claim 4 wherein the number of said upstanding segments and said openings is four, said segments being arranged in pairs of two on opposing sides of said pressed end portion of said envelope.

6. The improvement according to Claim 2 wherein each of said parts of said clamp member includes at least one skirt portion, each of said skirt portions providing said contact with said upstanding portion of said insert member and being secured thereto.

7. The improvement according to Claim 6 wherein said insert member is of substantially cylindrical configuration and said upstanding portion is located substantially around the entire internal periphery of said insert member, said skirt portions being fixedly secured to said upstanding portion at spaced locations therealong.

8. The improvement according to Claim 7 wherein the portion of said insert member having said upstanding portion therein is located externally of said cavity within said insulative holder.

9. The improvement according to Claim 7 wherein said skirt portions are secured to said upstanding portion by welding.

10. In an automobile headlight including a concave reflector having an opening within the rear portion thereof, a front lens member for directing light from said headlight in a predetermined manner, and a lamp unit for being removably positioned within said opening of said reflector, said lamp unit including an electrically insulative holder for being positioned within said opening and defining a cavity therein and an electric lamp adapted for being positioned within said holder, said lamp including an envelope having a filament structure therein and at least two lead-in wires projecting from said envelope, said filament structure being oriented within said reflector of said automobile headlight when said holder is positioned within said opening, the improvement comprising:

a clamp member secured about said envelope of said electric lamp at a precise location relative to said filament structure; and

an insert member partly inserted a predetermined distance within said cavity of said insulative holder and defining an opening therein, said insert member having an upstanding portion extending within said opening, said clamp member being positioned within said opening within said insert member in contact with said upstanding portion and fixedly secured only to said upstanding portion such that said filament structure will be oriented within said reflector in a precise manner relative thereto when said insulative holder is positioned within said reflector opening.

11. The improvement according to Claim 10 wherein said clamp member is of two-part construction and said envelope of said electric lamp includes a pressed end portion, said clamp member being secured about said end portion.

12. The improvement according to Claim 11 wherein each of said two parts are located about said pressed end portion and thereafter secured to each other.

13. The improvement according to Claim 11 wherein said pressed end portion of said envelope includes at least one upstanding segment thereon and said clamp member includes at least one opening therein, said upstanding segment being located within said opening to thereby assist in orienting said clamp member at said precise location relative to said filament structure.

14. The improvement according to Claim 13 wherein the number of said upstanding segments and said openings is four, said segments being arranged in pairs of two on opposing sides of said pressed end portion of said envelope.

15. The improvement according to Claim 11 wherein each of said parts of said clamp member includes at least one skirt portion, each of said skirt portions providing said contact with said upstanding portion of said insert member and being secured thereto.

16. The improvement according to Claim 15 wherein said insert member is of substantially cylindrical configuration and said upstanding portion is located substantially around the entire internal periphery of said insert member, said skirt portions being fixedly secured to said upstanding portion at spaced locations therealong.

17. The improvement according to Claim 16 wherein the portion of said insert member having said upstanding portion therein is located externally of said cavity within said insulative holder.

18. The improvement according to Claim 16 wherein said skirt portions are secured to said upstanding portion by welding.

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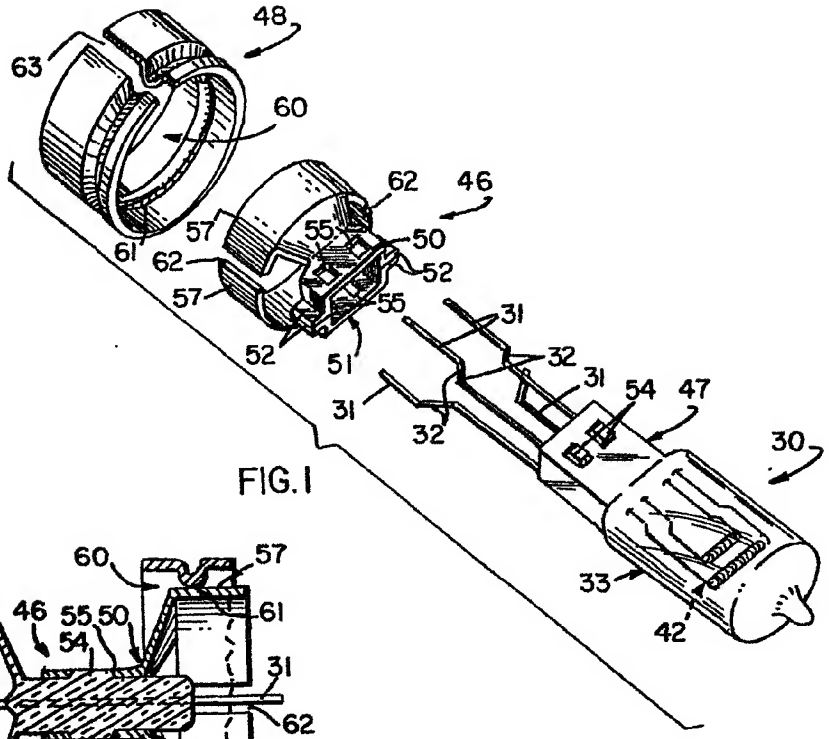


FIG.1

FIG.3

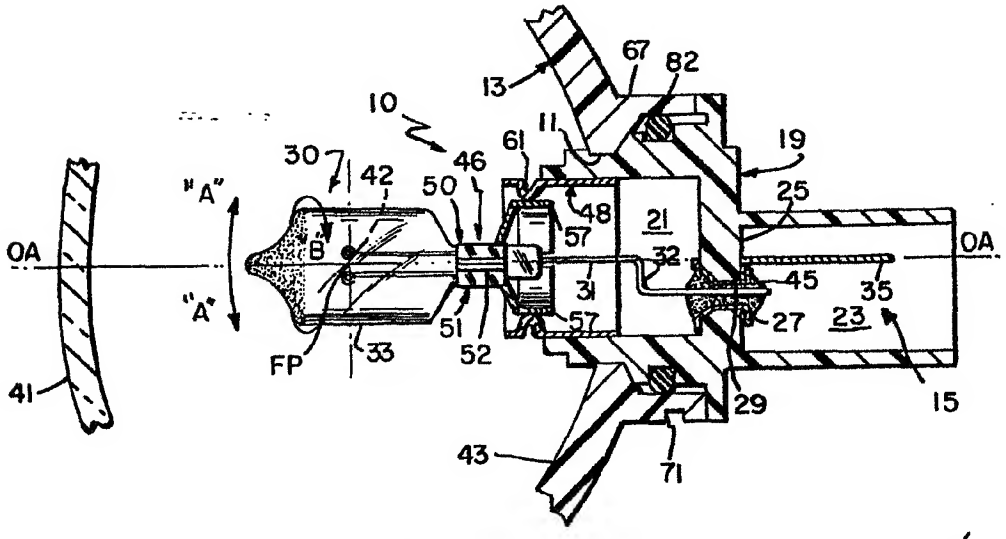


FIG.2

DEUTSCHES REICH

AUSGEGEBEN AM
28. JUNI 1930

REICHSPATENTAMT

PATENTSCHRIFT

№ 495321

KLASSE 4b GRUPPE 11

G 76907 IX/4b

Tag der Bekanntmachung über die Erteilung des Patents: 20. März 1930

Emil Groh und Hermann Riegermann in Berlin

Abblendbarer Scheinwerfer, insbesondere für Kraftfahrzeuge

Zusatz zum Patent 487861

Patentiert im Deutschen Reiche vom 22. März 1929 ab

Das Hauptpatent hat angefangen am 2. Oktober 1928.

Die Erfindung betrifft einen abblendbaren Scheinwerfer, insbesondere fur Kraftfahrzeuge, dessen Reflektor zusammen mit der elektrischen Lichtquelle unter Vermittlung von Elektromagneten nach abwärts kippbar ist, nach Patent 487861 und bezweckt eine sichere Feststellung des in dem Kugelgelenk verschwenkbar gelagerten Reflektors in den durch die drei Elektromagnete bestimmten Stellungen und einen Gewichtsausgleich des Reflektors.

In der Zeichnung ist ein Ausführungsbeispiel dargestellt.

Abb. 1 ist ein Längsschnitt und

Abb. 2 eine Ansicht von hinten bei abgenommenem Gehäuse.

Es ist, wie im Hauptpatent, *a* der Parabolspiegel mit dem rohrförmigen Ansatz *b*, der in der Kugel *c* gelagert ist, die ihrerseits von der Scheibe *e* getragen wird. Diese dient als Träger für die Elektromagnete m^1, m^2, m^3, von denen der Magnet m^1 den Spiegel in der normalen Stellung hält, während er beim Einschalten eines der Magnete m^2 oder m^3 abwärts nach rechts oder links gekippt wird.

Auf dem hinteren Ende des Rohres *b* sind entsprechend der Zahl der Magnete drei Eisenplatten 1, 2, 3 befestigt, die den Magneten gegenüberstehen und so zum Rohr *b* angeordnet sind, daß, wenn eine der Eisenplatten (z. B. 1 in Abb. 1) von dem zugehörigen Magneten angezogen ist, die beiden anderen Platten von ihren Magneten abgekippt sind.

Ferner ist zwischen den drei Magnetpaaren an der Scheibe *e* bei 4 je eine als Doppelhebel ausgebildete Sperrklinke 5, 6, 7 drehbar gelagert, deren Nasen über einen am Spiegel *a* befestigten Ring 8 greifen können und deren freie Hebelarme unter dem Druck von in der Scheibe *e* gelagerten Federn 9 stehen. Diese Arme sind nach innen plattenförmig abgebogen bzw. tragen Platten 11, 12, 13 mit einem Schuh 14 an jeder Seite, wobei die Schuhe der Form der Magneten angepaßt sind.

Die Wirkungsweise ist folgende:

Der Lichtstrom geht in der normalen, d. h. waagerechten Stellung des Spiegels durch den Magneten m^1. Dieser zieht infolgedessen die Platte 1 an, während die Platten 2, 3 von ihren Magneten abgekippt sind. Da die Magnete m^2, m^3 stromlos sind, so wirken sie auch nicht auf die Platte 11 der Sperrklinke 5, infolgedessen hebt ihre Feder 9 die Platte 11 an und die Sperrklinke 5 greift uber den Ring 8 und hält den Spiegel in der normalen Stellung. Wird der Lichtstrom über den Magneten m^1 unterbrochen und z. B. durch den Magneten m^2 geschickt, so wird die entsprechende Platte 2 angezogen und die Platte 1 abgehoben, wodurch der Spiegel um das Gelenk *c* nach unten verschwenkt wird. Dies ist

möglich, da beim Anziehen der Platte 2 diese gegen die Platte 11 stößt und sie nach der Scheibe *e* zu drückt, wodurch die Sperrklinke 5 von dem Ring 8 abgehoben wird, während die sich von der Scheibe entfernende Platte 1 die Platten 12, 13 bzw. die an ihnen sitzenden Schuhe 14 frei gibt, so daß deren Federn 9 die Klinken 6, 7 nach dem Ring 8 zu schwingen können. Von diesen beiden Klinken tritt aber nur die Klinke 6 hinter den Ring 8, da die Klinke 7 durch den Magneten m^2 seitlich verschwenkt und dadurch an dem Einfallen verhindert wird. Es arbeitet also jeweils die Klinke, die dem vom Strom durchflossenen Magneten gegenüber bzw. zwischen zwei stromlosen Magneten liegt.

Patentansprüche:

1. Abblendbarer Scheinwerfer, insbesondere für Kraftfahrzeuge, nach Patent 487 861, dadurch gekennzeichnet, daß gegenüber den Elektromagneten (m^1, m^2, m^3) auf dem Reflektorträger (*b*) als Gegengewichte für den Reflektor ausgebildete Platten (1, 2, 3) vorgesehen sind, so daß durch Anziehung der zu dem jeweils Strom führenden Magneten gehörenden Platte das Kippen des Reflektors unterstützt wird.

2. Scheinwerfer nach Anspruch 1, gekennzeichnet durch je eine mit jedem Elektromagneten (m^1, m^2, m^3) verbundene Sperrklinke (5, 6, 7), von denen die jeweils durch den zugehörigen Magneten angezogene, den Reflektor in der Arbeitsstellung festhaltende Sperrklinke beim Einschalten eines anderen Magneten durch die Platte ausgelöst und die dem neu erregten Magneten entsprechende Sperrklinke in den Rand (8) des Reflektors (*a*) eingehakt wird.

Hierzu 1 Blatt Zeichnungen

BERLIN. GEDRUCKT IN DER REICHSDRUCKEREI

Zu der Patentschrift **495 321**
Kl. 4b Gr. 11

Abb. 1

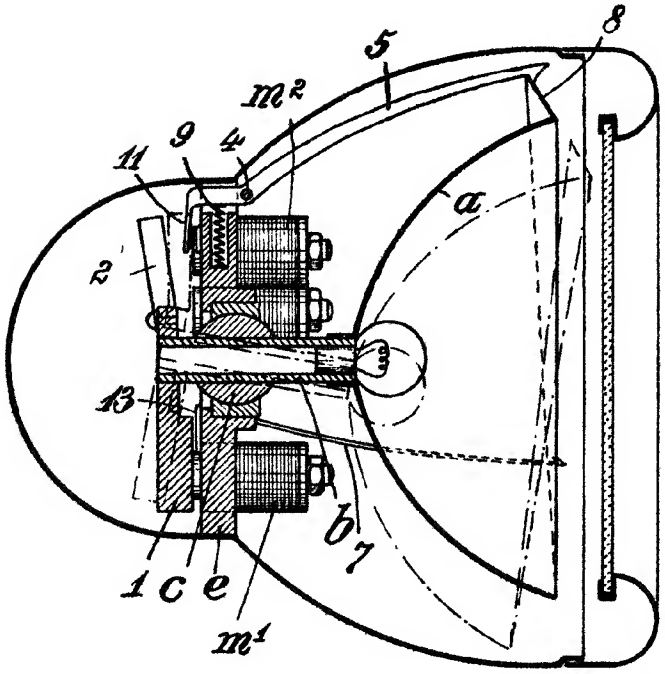
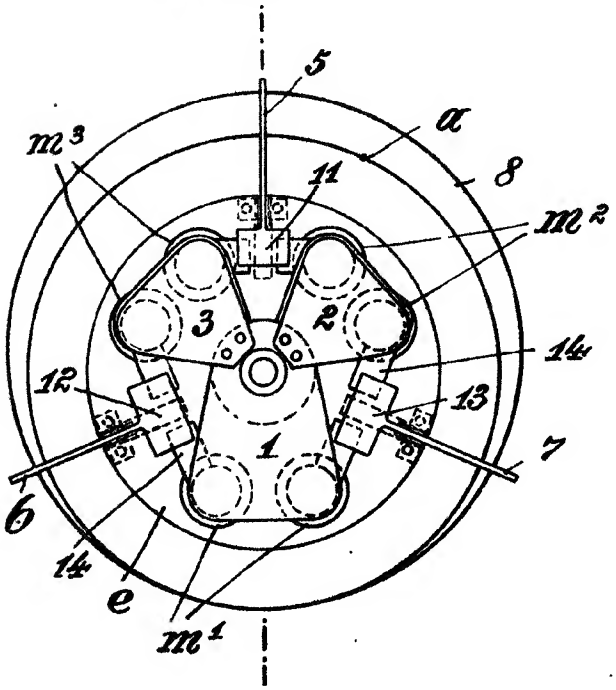


Abb. 2



DEUTSCHES REICH

AUSGEGEBEN
AM 17. MAI 1923

REICHSPATENTAMT

PATENTSCHRIFT

— № 375650 —

KLASSE 4b GRUPPE 11

(B 104327 VI/4b)

Robert Bosch Akt.-Ges. in Stuttgart.

Elektrischer Scheinwerfer.

Patentiert im Deutschen Reiche vom 2. April 1922 ab.

Die vorliegende Erfindung bezieht sich auf einen elektrischen Scheinwerfer, der insbesondere auf Fahrzeugen Verwendung finden soll. Es ist aus bekannten Gründen vielfach erwünscht, daß während der Fahrt die vom Scheinwerfer normalerweise parallel zur Fahrstraße ausgesandten Strahlen gegen die Fahrstraße hin abgelenkt werden oder unmittelbar vor dem Fahrzeug selbst auf die Fahrstraße gelangen.

Zu diesem Zweck wurden bereits Scheinwerfer vorgeschlagen, die im ganzen um eine Achse senkrecht zur Reflektorachse und parallel zur Fahrstraße schwenkbar angeordnet sind. Derartige Scheinwerfer müssen jedoch, um sich bei den auftretenden Erschütterungen nicht selbst zu verstellen, ziemlich fest in ihre Drehgelenke eingespannt werden, wodurch das Verstellen von Hand oft sehr schwer wird. Man hat ferner bereits Scheinwerfer, bei denen das Gehäuse seine wagerechte Stellung beibehält, während der Reflektor so verstellt werden kann, daß die Lichtstrahlen gegen die Fahrbahn geneigt werden. Die Verstellung dieser Scheinwerfer ist schon wesentlich leichter, allein die Einrichtungen zum Verstellen sind verhältnismäßig verwickelt und daher teuer und nicht immer zuverlässig.

Diese Nachteile werden nun nach der Erfindung dadurch vermieden, daß sich die Achse des Scheinwerfergehäuses und des Reflektors kreuzen, so daß durch Drehen des Reflektors oder des Gehäuses oder beider Teile zusammen um die Gehäuseachse die Richtung der vom Reflektor ausgesandten Strahlen verändert wird. Dabei können sich die Reflektor- und Gehäuseachse schneiden oder unter Bildung einer windschiefen Ebene aneinander vorbeilaufen. Eine besonders zweckmäßige Ausführungsform erhält man, wenn man die Achsen im Berührungspunkt des Mittelkontaks der Glühlampe mit seinem Gegenkontakt sich schneiden läßt, da in diesem Falle beim Drehen des Reflektors der Mittelkontakt der im Reflektor befestigten Glühlampe auf seinem Gegenkontakt keinen Kreis beschreibt.

Auf der Zeichnung sind drei Ausführungsbeispiele des Erfindungsgegenstandes im Längsschnitt dargestellt.

Abb. 1 zeigt das eine Ausführungsbeispiel, wobei das Gehäuse feststeht, während der Reflektor drehbar im Gehäuse angeordnet ist.

In Abb. 2 ist das zweite Ausführungsbeispiel an einem Scheinwerfer dargestellt, der an der Lenkstange eines Motorrades befestigt ist. Bei diesem Ausführungsbeispiel sind Gehäuse und Reflektor zusammen um die Gehäuseachse drehbar angeordnet.

Abb. 3 zeigt das dritte Ausführungsbeispiel.

Bei dem ersten Ausführungsbeispiel nach Abb. 1 ist *a* ein Scheinwerfergehäuse, welches auf einem Kabelzuführungsrohr *b* befestigt ist. In dem Kabelzuführungsrohr *b* ist der Halter *d* mit dem Reflektor *e* gelagert, dessen Achse *f*, *f* geneigt zur Scheinwerferachse *c*, *c* ist. Der Halter *d* dient gleichzeitig als Griff beim Drehen. In dem Reflektor ist eine elektrische Glühlampe *g* angeordnet. Durch eine Rastenfeder *h*, die an der Öffnung des Reflektors *e* angreift, kann der Reflektor in seiner gehobenen Lage, wobei er die Strahlen parallel zur Fahrstraße aussendet oder in seiner geneigten

Lage (wie gezeichnet), wobei die Strahlen in kurzer Entfernung vor das Fahrzeug gegen die Fahrstraße geworfen werden, festgehalten werden. Gegebenenfalls kann man auch noch Rasten für Zwischenstellungen vorsehen, in denen die Strahlen rechts oder links nach der Seite gerichtet werden.

Bei dem Ausführungsbeispiel nach Abb. 2 ist das Scheinwerfergehäuse *a* fest mit dem Reflektor *e* verbunden, und beide Teile sind gemeinsam um ein den Scheitel des Gehäuses durchdringendes Kabelzuführungsrohr *m* drehbar gelagert. Die Achse des Gehäuses ist wiederum mit *c*, *c* bezeichnet, die des Reflektors mit *f*, *f*. Zur Erzielung einer zweiten Lagerung des Gehäuses ist an dem Kabelzuführungsrohr *m* ein Führungsring *n* befestigt, der in das Gehäuse *a* hineinragt. Der Führungsring *n* hat zweckmäßig eine Rinne *o*, in welche Kugeln *p* eingelegt sind, so daß diese Lagerstelle des Gehäuses auf dem Führungsring wie ein Kugellager ausgebildet ist. Zum Heben oder Senken der Lichtstrahlen wird bei dieser Ausführung an dem Rande *q* des Scheinwerfergehäuses gedreht.

Der Schnittpunkt der Gehäuseachse *f*, *f* mit der Reflektorachse *c*, *c* fällt auch hier mit der Berührungsstelle des Mittelkontaks der Glühlampe *g* mit seinem Gegenkontakt zusammen. Um den Scheinwerfer in der gesenkten oder gehobenen Stellung festhalten zu können, ist zwischen dem drehbaren und dem feststehenden Teil eine Rasteneinrichtung *r* vorgesehen, die an dem äußersten Teil des Führungsringes *n* angeordnet ist, um sie auf einen möglichst großen Kreis zu verlegen und dadurch recht wirksam zu gestalten. Der Scheinwerfer ist um den Winkel, den die beiden Achsen *c*, *c* und *f*, *f* miteinander bilden, gegen die Wagerechte geneigt, so daß die Achse des Reflektors in der obersten Stellung die Lage *f*, *f* hat. Die Strahlen werden dann parallel zur Fahrstraße geworfen. Ist der Reflektor auf die größte Neigung eingestellt, so nimmt seine Achse die Stellung f^1-f^1 ein, und die Lichtstrahlen fallen um den doppelten Winkel, den die Achse *c*, *c* und *f*, *f* miteinander bilden, gegen die Fahrstraße.

Beim dritten Ausführungsbeispiel nach Abb. 3 wird zum Ablenken der Lichtstrahlen nur das Scheinwerfergehäuse *a* gedreht, während der Reflektor *e* undrehbar, aber doch nach allen Seiten gelenkig mit dem Kabelzuführungsrohr *m* verbunden ist. Die Lagerung des Gehäuses *a* ist wiederum wie beim zweiten Ausführungsbeispiel beschrieben ausgeführt

Wird das Gehäuse zwecks Hebens oder Senkens der Lichtstrahlen gedreht, so verschiebt ein mit dem Gehäuse *a* fest verbundener Bügel *i*, der am äußeren Rande *k* des schräg gestellten Reflektors *e* angreift, den Reflektor so, daß seine Achse *f*, *f* gegen die Wagerechte gehoben oder gesenkt wird; damit der Reflektor *e* diese Bewegungen ausführen kann, ist er zweckmäßig nach Art eines Kardangelenks *s* mit dem Kabelzuführungsrohr *m* verbunden.

Aus den schon erwähnten Gründen fällt auch bei diesem Ausführungsbeispiel der Kreuzungspunkt der Reflektorachse *f*, *f* mit der Gehäuseachse *c*, *c* in die Berührungsstelle des Mittelkontakts der Glühlampe *g* mit seinem Gegenkontakt. Dabei ist es natürlich vorteilhaft, daß die Mittellinien des Gelenks zwischen Reflektor und Kabelzuführungsrohr ebenfalls durch diesen Berührungspunkt gehen.

Die Rasteneinrichtung *r* wirkt auch hier wie beim zweiten Ausführungsbeispiel.

Patent-Ansprüche:

1. Elektrischer Scheinwerfer, insbesondere für Fahrzeuge, dadurch gekennzeichnet, daß der Reflektor oder das Gehäuse oder beide Teile zusammen gedreht werden können, wobei die Achsen des Scheinwerfergehäuses und des Reflektors sich stets kreuzen.

2. Ausführungsform des Scheinwerfers nach Anspruch 1, dadurch gekennzeichnet, daß die Kreuzung der Reflektor- mit der Gehäuseachse an der Berührungsstelle des Mittelkontakts der Glühlampe (*g*) mit seinem Gegenkontakt liegt.

3. Ausführungsform des Scheinwerfers nach Anspruch 1, dadurch gekennzeichnet, daß das Gehäuse (*a*) samt dem fest eingebauten Reflektor (*e*) um ein den Scheitel des Gehäuses durchdringendes Kabelzuführungsrohr (*m*) drehbar ist.

4. Ausführungsform des Scheinwerfers nach Anspruch 3, dadurch gekennzeichnet, daß zur zweiten Lagerung des Gehäuses an dem Kabelzuführungsrohr (*m*) ein in das Gehäuse hineinragender Führungsring (*n*) befestigt ist.

5. Ausführungsform der Scheinwerfers nach Anspruch 4, dadurch gekennzeichnet, daß der Führungsring als Kugellager ausgebildet ist.

6. Ausführungsform des Scheinwerfers nach Anspruch 4, dadurch gekennzeichnet, daß die Rasteneinrichtung (*r*) zwischen dem drehbaren (*a*, *b*) und dem feststehenden Teil (*n*, *n*) des Scheinwerfers am Führungsring (*n*) angeordnet ist, um sie auf einen möglichst großen Kreis zu verlegen.

Hierzu 1 Blatt Zeichnungen.

BERLIN. GEDRUCKT IN DER REICHSDRUCKEREI.

Zu der Patentschrift **375650**
Kl. **4b** Gr. **11**

Abb. 1.

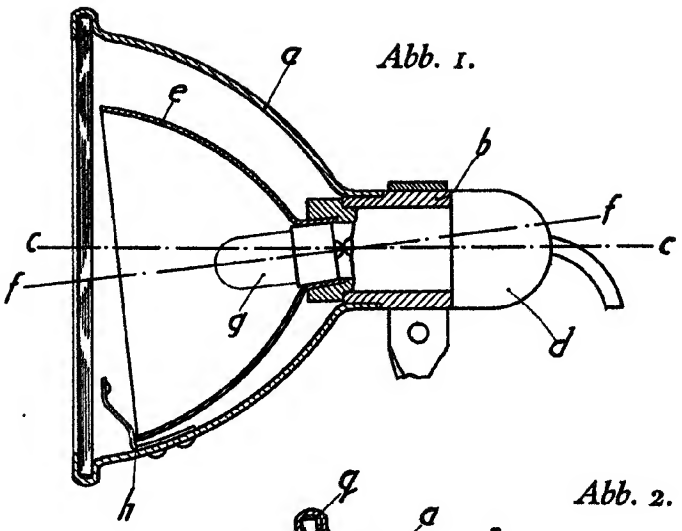


Abb. 2.

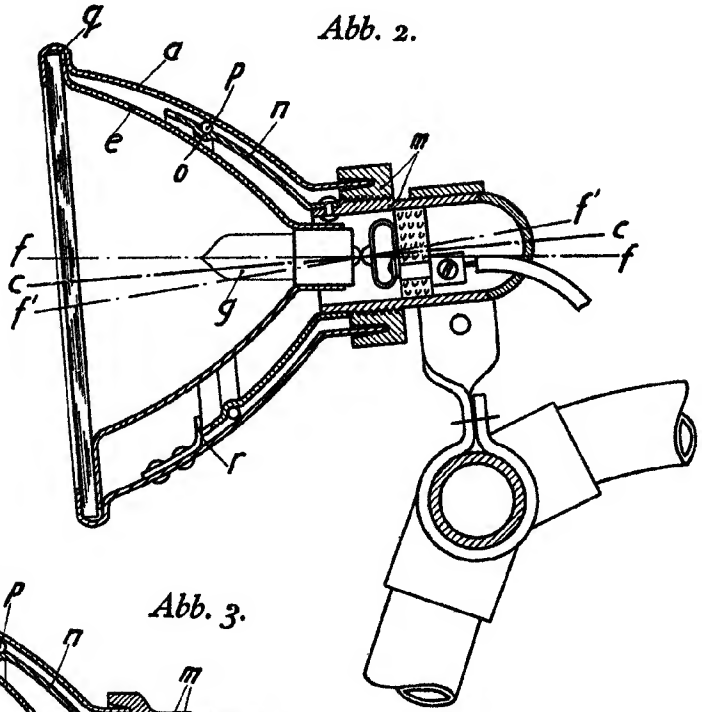
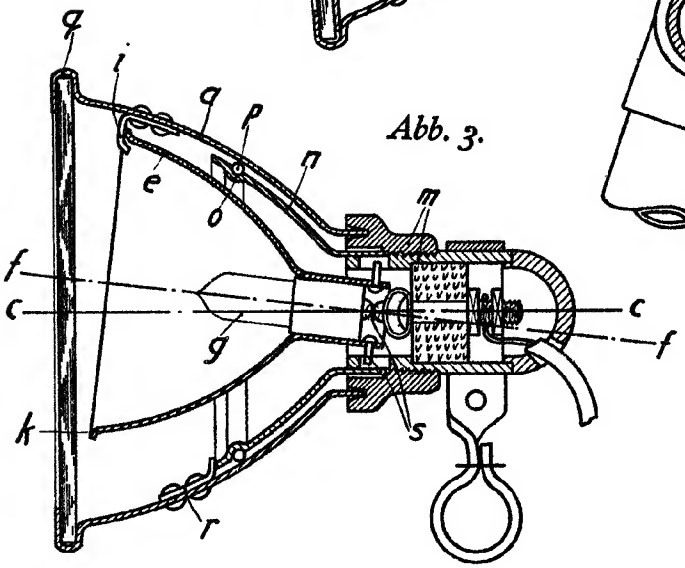


Abb. 3.



PHOTOGR. DRUCK DER REICHSDRUCKEREI.

(19) BUNDESREPUBLIK DEUTSCHLAND

DEUTSCHES PATENTAMT

(12) **Patentschrift**

(10) **DE 44 21 354 C 1**

(51) Int. Cl.[6]:
F 21 M 7/00
B 60 Q 1/06

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(22) Anmeldetag: 17. 6. 94
(43) Offenlegungstag: —
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DE 44 21 354 C1

Innerhalb von 3 Monaten nach Veröffentlichung der Erteilung kann Einspruch erhoben werden

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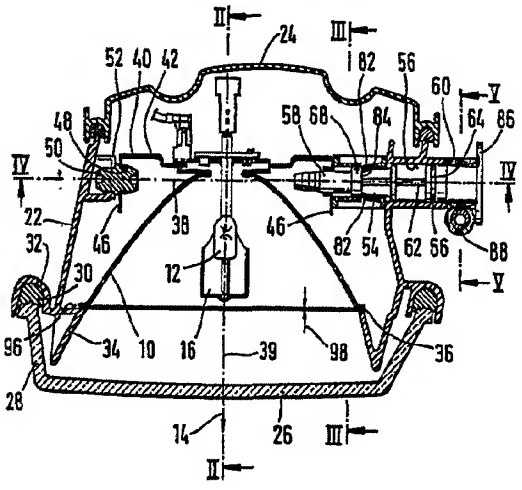
(56) Für die Beurteilung der Patentfähigkeit in Betracht gezogene Druckschriften:
DE 36 20 800 A1

(54) Halterungs- und Reflektoraufbau für einen verschwenkbaren Reflektor für einen Fahrzeugscheinwerfer

(57) Der Scheinwerfer weist einen Reflektor (10) auf, der innerhalb eines Gehäuses (22) um eine Achse (38) schwenkbar gelagert ist. Die Schwenkachse (38) verläuft etwa in einer horizontalen Mittelebene des Reflektors (10) nahe dessen Scheitelbereich. Der in Lichtaustrittsrichtung (14) weisende Vorderrand (36) des Reflektors (10) ist in Ebenen senkrecht zur Schwenkachse (38) zumindest annähernd kreisbogenförmig ausgebildet und dessen Mittelpunkt ist zumindest annähernd auf der Schwenkachse (38) angeordnet. Das Gehäuse (22) weist einen Teil (34) auf, dessen entgegen Lichtaustrittsrichtung (14) weisender Rand (96) an den Vorderrand (36) des Reflektors (10) angrenzt und in Ebenen senkrecht zur Schwenkachse (38) ebenfalls zumindest annähernd kreisbogenförmig ausgebildet ist und dessen Mittelpunkt zumindest annähernd auf der Schwenkachse (38) angeordnet ist. Durch diese Ausbildung kann der Spalt (98) zwischen dem Gehäuseteilrand (96) und dem Reflektorvorderrand (36) klein gehalten werden, da er sich bei einer Schwenkbewegung des Reflektors (10) um die Schwenkachse (38) nicht oder nur wenig ändert.



DE 44 21 354 C1

Beschreibung

Die Erfindung geht aus von einem Halterungs- und Reflektoraufbau für einen verschwenkbaren Reflektor für einen Fahrzeugscheinwerfer nach der Gattung des Anspruchs 1.

Ein solcher Halterungs- und Reflektoraufbau ist durch die DE 36 20 800 A1 bekannt. Dabei weist der Scheinwerfer einen Reflektor auf, der an einer Halterung um wenigstens eine Achse schwenkbar gelagert ist. Die Halterung ist dabei als ein Gehäuse ausgebildet, innerhalb der der Reflektor angeordnet ist. Der in Lichtaustrittsrichtung weisende Vorderrand des Reflektors ist im wesentlichen eben ausgebildet und liegt in einer Ebene, die senkrecht zur optischen Achse des Reflektors angeordnet ist. Der Reflektor ist um eine etwa horizontal verlaufende Schwenkachse zur Einstellung der Richtung des vom Reflektor reflektierten Lichtbündels in vertikaler Richtung und um eine etwa vertikal verlaufende Schwenkachse zur Einstellung der Richtung des vom Reflektor reflektierten Lichtbündels in horizontaler Richtung schwenkbar. Die Schwenkachsen sind jeweils in Randbereichen des Reflektors angeordnet. Bei einer Schwenkbewegung bewegt sich der Vorderrand des Reflektors sowohl quer zur optischen Achse als auch in Richtung der optischen Achse, so daß es erforderlich ist, daß sowohl zwischen dem Rand des Reflektors und der Halterung quer zur optischen Achse ein gewisser Abstand vorhanden ist als auch zwischen dem in Lichtaustrittsrichtung weisenden Vorderrand des Reflektors und einem an diesen angrenzenden, entgegen Lichtaustrittsrichtung weisenden Teil der Halterung in Richtung der optischen Achse ein gewisser Abstand vorhanden ist. Diese Abstände sind von außerhalb des Scheinwerfers sichtbar und erwecken unter Umständen den Eindruck einer ungenauen Fertigung und Montage des Scheinwerfers.

Der Erfindung liegt die Aufgabe zugrunde, den gattungsgemäßen Halterungs- und Reflektoraufbau derart weiterzubilden, daß der Abstand zwischen dem Vorderrand des Reflektors und dem an diesen angrenzenden Teil der Halterung möglichst gering gehalten werden kann.

Diese Aufgabe wird durch die kennzeichnenden Merkmale gemäß Anspruch 1 gelöst. In den abhängigen Ansprüchen sind vorteilhafte Ausgestaltungen und Weiterbildungen der Erfindung angegeben.

Ein Ausführungsbeispiel der Erfindung ist in der Zeichnung dargestellt und in der nachfolgenden Beschreibung näher erläutert. Es zeigen

Fig. 1 einen Scheinwerfer für Fahrzeuge in einem horizontalen Längsschnitt entlang Linie I-I in **Fig. 2**, **Fig. 2** den Scheinwerfer in einem vertikalen Längsschnitt entlang Linie II-II in **Fig. 1**, **Fig. 3** den Scheinwerfer in einem vertikalen Längsschnitt entlang Linie III-III in **Fig. 1**, **Fig. 4** den Scheinwerfer in einem vertikalen Querschnitt entlang Linie IV-IV in **Fig. 1** und **Fig. 5** den Scheinwerfer in einem vertikalen Längsschnitt entlang Linie V-V in **Fig. 1**.

Ein in den **Fig. 1** bis 5 dargestellter Scheinwerfer für Fahrzeuge, insbesondere Kraftfahrzeuge, weist einen Reflektor **10** auf, in den eine Lichtquelle **12** eingesetzt ist. Als Lichtquelle **12** kann eine Glühlampe oder eine Gasentladungslampe verwendet werden. Der Reflektor **10** besteht aus Blech, kann jedoch auch aus beliebigen anderen geeigneten Werkstoffen hergestellt werden, beispielsweise aus Kunststoff. Um direkt von der Lichtquelle **12** in Lichtaustrittsrichtung **14** ausgesandtes Licht abzuschirmen ist eine Abschirmkappe **16** vorgesehen, die die Lichtquelle **12** teilweise umgibt und die, wie in **Fig. 2** dargestellt, über einen Träger **18** an einer oberen Wandung **20** des Reflektors **10** befestigt ist. Der Reflektor **10** ist an einer Halterung in Form eines Gehäuses **22** verstellbar gelagert. Das Gehäuse **22** weist an seiner entgegen Lichtaustrittsrichtung **14** weisenden Rückseite eine Öffnung auf, die mittels einer Kappe **24** verschließbar ist und durch die die Lichtquelle **12** zu einem Austausch zugänglich ist. Die Lichtaustrittsöffnung des Gehäuses **22** ist mit einer lichtdurchlässigen Abdeckscheibe **26** verschlossen, die glatt ausgebildet sein kann oder mit optisch wirksamen Elementen versehen sein kann. Die Abdeckscheibe **26** weist einen zum Gehäuse **22** weisenden umlaufenden Rand **28** auf, der in einer umlaufenden, in Lichtaustrittsrichtung **14** offenen Nut **30** aufgenommen ist, die in einem am Gehäuse **22** nach außen abstehenden Flansch **32** ausgebildet ist. Das Gehäuse **22** weist einen innerhalb des umlaufenden Rands **28** der Abdeckscheibe **26** angeordneten Abschnitt (Teil **34**) auf, der in Lichtaustrittsrichtung **14** über den Flansch **32** hinausragt und sich entgegen Lichtaustrittsrichtung **14** verjüngend ausgebildet ist. Der Abschnitt **34** kann auch als separates Teil ausgebildet sein, das mit dem Gehäuse **22** verbunden ist. Der Abschnitt **34** kann konisch ausgebildet sein oder gekrümmt und dessen entgegen Lichtaustrittsrichtung **14** weisendes Ende weist einen etwa der Innenfläche des Reflektors **10** an dessen in Lichtaustrittsrichtung **14** weisendem Vorderrand **36** entsprechenden freien Querschnitt auf, so daß vom Reflektor **10** reflektiertes Licht ungehindert durch den Abschnitt **34** austreten kann.

Der Reflektor **10** ist innerhalb des Gehäuses **22** angeordnet und in diesem um eine etwa horizontal verlaufende Achse **38** verschwenkbar gelagert. Eine Verschwenkbarkeit des Reflektors **10** um eine horizontale Achse ist beispielsweise bei Nebelscheinwerfern für Kraftfahrzeuge erforderlich, um eine Einstellung der Neigung des Reflektors, wie sie gesetzlich vorgeschrieben ist, zu ermöglichen. Die Achse **38** verläuft etwa in der horizontalen Längsmittelebene des Reflektors **10** senkrecht zur optischen Achse **39** des Reflektors **10** und nahe dessen Scheitelbereich. Mit dem Reflektor **10** ist ein Halteelement **40** starr verbunden, das als ein Halterahmen ausgebildet ist und im Bereich des Scheitels des Reflektors **10** angeordnet ist. Der Halterahmen **40** weist, wie in **Fig. 1** dargestellt, einen mit dem Reflektor **10** verbundenen, im wesentlichen ebenen Hauptbereich **42** auf, der sich etwa senkrecht zur optischen Achse **39** erstreckt, und seitliche, etwa parallel zur optischen Achse **39** des Reflektors **10** verlaufende, in Lichtaustrittsrichtung **14** weisende Lagerbereiche **46**. Die Lagerbereiche **46** weisen jeweils eine Öffnung **48** auf, in die Lagerelemente mit ihren Enden eingreifen, die mit ihrem anderen Enden in Wandungen des Gehäuses **22** gelagert sind. Ein Lagerelement **50**, in **Fig. 1** links, ist als ein Bolzen ausgebildet, der in einer Aufnahme **52** in einer Seitenwand des Gehäuses **22** gelagert ist. Der Bolzen **50** ist in die Öffnung **48** eingepreßt und in der Aufnahme **52** schwenkbar gelagert. In die Öffnung **48** des anderen Lagerbereichs **46**, in **Fig. 1** rechts, greift ein Verstellelement **54** ein, das in einer zylinderförmigen Aufnahme **56** in der der Aufnahme **52** gegenüberliegenden Seitenwand des Gehäuses **22** drehbar gelagert ist und Teil einer Verstelleinrichtung ist, durch die der Reflektor **10** um die Achse **38** verschwenkt werden kann. Über das Lagerelement **50** und das Verstellelement **54** ist der Halterahmen **40** zusammen mit dem Reflektor **10** um die

durch diese bestimmte Achse 38 verschwenkbar gelagert.

Das Verstellelement 54 weist an seinem vorderen Ende einen in die Öffnung 48 des Lagerbereichs 46 eingepreßten zapfenartigen Abschnitt 58 auf und ragt mit seinem anderen Ende 60 aus dem Gehäuse 22 heraus. In der Aufnahme 56 weist das Verstellelement 54 einen in seiner Außenkontur zumindest abschnittsweise kreiszylinderförmigen Abschnitt 62 auf, der mit einer Ringnut 64 versehen ist, zwischen der und der Aufnahme 56 ein Dichtring 66 eingespannt ist. Der zapfenartige Abschnitt 58 und der in der Aufnahme 56 gelagerte Abschnitt 62 des Verstellelements 54 sind koaxial zueinander angeordnet und bestimmen die Achse 38. Der Lagerbereich 46 ist mit Abstand zur Innenseite der Seitenwand des Gehäuses 22 angeordnet, in der die Aufnahme 56 ausgebildet ist. Das Verstellelement 54 weist zwischen der Aufnahme 56 und dem Lagerbereich 46 einen Abschnitt 68 auf, der exzentrisch zur Achse 38 ausgebildet ist. Der Abschnitt 68 ist, wie in Fig. 3 dargestellt, im Schnitt senkrecht zur Achse 38 zumindest annährend kreisförmig ausgebildet und weist einen solchen Durchmesser auf, daß das Verstellelement 54 von außerhalb des Gehäuses 22 in die Aufnahme 56 eingeführt werden kann.

Im Gehäuse 22 ist als weiterer Teil der Verstelleinrichtung ein Übertragungselement 70 angeordnet, das beim Ausführungsbeispiel zweiarmig ausgebildet ist und in der Einbaulage des Scheinwerfers mit seiner Längserstreckung etwa vertikal angeordnet ist. Das Übertragungselement 70 ist, wie in Fig. 3 dargestellt, um eine exzentrisch zur Achse 38 des Reflektors 10 verlaufende Achse 74 in einer Aufnahme 75 im Gehäuse 22 schwenkbar gelagert, wobei die Achse 74 zumindest annähernd parallel zur Achse 38 des Reflektors 10 verläuft. Beim Ausführungsbeispiel ist die Achse 74 am unteren Endbereich 72 des Übertragungselements 70 angeordnet. Das Übertragungselement 70 ist außerdem exzentrisch zur Achse 38 des Reflektors 10 um eine Achse 78 schwenkbar am Halterahmen 40 angelenkt, wobei die Achse 78 zumindest annähernd parallel zur Achse 38 verläuft. Beim Ausführungsbeispiel ist das Übertragungselement 70 an seinem oberen Endbereich 76 an einem Lagerbereich 46 des Halterahmens 40 angelenkt. Die verschwenkbare Verbindung des oberen Endbereichs 76 des Übertragungselements 70 mit dem Lagerbereich 46 ist über einen an diesem angeordneten Zapfen 77 bewirkt, der in eine Öffnung in einem oberen Bereich des Lagerbereichs 46 eingreift, die etwa vertikal über der Öffnung 48 angeordnet ist, in die der zapfenartige Abschnitt 58 des Verstellelements 54 eingreift. Das Übertragungselement 70 weist eine Ausnehmung 80 auf, in der der exzentrische Abschnitt 68 des Verstellelements 54 angeordnet ist. Beim Ausführungsbeispiel ist die Ausnehmung 80 zwischen den Endbereichen 72 und 76 des Übertragungselements 70 angeordnet. Die Ausnehmung 80 ist als ein Langloch ausgebildet, das in radialer Richtung bezüglich der Achse 74 um die der untere Endbereich 72 des Übertragungselements 70 schwenkbar gelagert ist eine größere Erstreckung aufweist als in tangentialer Richtung bezüglich der Achse 74. Die Weite der Ausnehmung 80 in tangentialer Richtung bezüglich der Achse 74 ist so bemessen, daß der exzentrische Abschnitt 68 des Verstellelements 54 mit geringem Spiel in der Ausnehmung 80 verdrehbar aufgenommen ist und in der Ausnehmung 80 in radialer Richtung bezüglich der Achse 74 verschiebbar ist. Das Übertragungselement 70 ist somit in tangentialer Richtung bezüglich der Achse 74 mit dem exzentrischen Abschnitt 68 des Verstellelements 54 gekoppelt.

Das Übertragungselement 70 besteht aus Kunststoff und an diesem ist, wie in Fig. 1 dargestellt, einstückig wenigstens ein quer zur Achse 38 federnd auslenkbarer Verriegelungsarm 82 ausgebildet, der in eine umlaufende Vertiefung 84 im Verstellelement 54 zum Gehäuse 22 hin neben dessen exzentrischem Abschnitt 68 eingreift und dadurch das Verstellelement 54 entlang der Achse 38 gegen Herausziehen aus dem Gehäuse 22 sichert. Beim Ausführungsbeispiel sind zwei Verriegelungsarme 82 vorhanden, die bezüglich der Achse 38 einander gegenüberliegend angeordnet sind. Die Seitenwände des Gehäuses 22 sind wie in Fig. 4 dargestellt im Schnitt senkrecht zur optischen Achse 39 betrachtet oval mit ihrer Krümmung nach außen weisend ausgebildet und das Übertragungselement 70 ist im Schnitt senkrecht zur optischen Achse 39 der Krümmung der neben diesem angeordneten Seitenwand des Gehäuses etwa u-förmig ausgebildet, wobei dessen Endbereiche 72 und 74 als Schenkel von der Seitenwand weg zum Reflektor 10 hin angeordnet sind.

Das außerhalb des Gehäuses 22 angeordnete Ende 60 des Verstellelements 54 ist über seinen Umfang mit einer Schneckenverzahnung versehen und an dessen Ende ist, wie in Fig. 1 dargestellt, ein Flansch 86 mit größerem Durchmesser ausgebildet. Das außerhalb des Gehäuses 22 angeordnete Ende 60 des Verstellelements 54 weist einen größeren Durchmesser auf als der in der Aufnahme 56 angeordnete Abschnitt 62, so daß zwischen diesen beiden Abschnitten (Ende) 60 und 62 eine Stufe vorhanden ist, die einen Anschlag bildet, der die Einschubbewegung des Verstellelements 54 in das Gehäuse 22 begrenzt. Außerhalb des Gehäuses 22 ist als weiterer Teil der Verstelleinrichtung und als Betätigungselement für das Verstellelement 54, wie in Fig. 5 dargestellt, eine Einstellschraube 88 angeordnet, die einen Abschnitt 90 mit einer Schnecke oder einem Gewinde aufweist, der mit der Schneckenverzahnung des Endes 60 des Verstellelements 54 in Eingriff steht. Die Einstellschraube 88 ist senkrecht zur Achse 38 und damit zur Längsachse des Verstellelements 54 angeordnet und weist an ihrem dem Abschnitt 90 gegenüberliegenden Ende einen Kopf 92 auf, der beispielsweise mit einem Sechskant und/oder einem Querschlitz zum Ansetzen eines Werkzeugs versehen ist. Die Einstellschraube 88 ist an einer von der Außenseite einer Seitenwand des Gehäuses 22 abstehenden Konsole 94 um ihre Längsachse 89 drehbar, aber in Richtung ihrer Längsachse 89 unverschiebbar gelagert. Beim dargestellten Ausführungsbeispiel ist die Einstellschraube 88 in Einbaulage des Scheinwerfers etwa vertikal angeordnet und weist mit ihrem Kopf 92 nach unten. Die Einstellschraube 88 kann jedoch auch in beliebigen anderen Stellungen senkrecht zur Achse 38 um den mit der Schneckenverzahnung versehenen Ende 60 herum angeordnet sein. Die Konsole 94 muß dabei jeweils entsprechend angeordnet sein. Die Anordnung der Einstellschraube 88 kann so gewählt werden, wie es für die jeweiligen Einbauverhältnisse des Scheinwerfers günstig ist. Die Schneckenverzahnung des Endes 60 und die Einstellschraube 88 bilden ein Untersetzungsgetriebe, das heißt, bei einem bestimmten Verdrehwinkel der Einstellschraube 88 um ihre Längsachse 89 wird das Verstellelement 54 nur um einen geringeren Verdrehwinkel um die Achse 38 verdreht.

Der in Lichtaustrittsrichtung 14 weisende Vorderrand 36 des Reflektors 10 ist in Ebenen senkrecht zur Achse

38 gekrümmt ausgebildet, wobei der Mittelpunkt von dessen Krümmung zumindest annähernd auf der Achse 38 zu liegen kommt. Der entgegen Lichtaustrittsrichtung 14 weisende Rand 96 des Abschnitts 34 des Gehäuses 22 ist in Ebenen senkrecht zur Achse 38 ebenfalls gekrümmt ausgebildet, wobei der Mittelpunkt von dessen Krümmung zumindest annähernd auf der Achse 38 zu liegen kommt. Die Krümmungen des Vorderrands 36 des Reflektors 10 und des Rands 96 des Abschnitts 34 sind zumindest annähernd parallel zueinander. Zwischen dem Vorderrand 36 des Reflektors 10 und dem Rand 96 des Abschnitts 34 ist ein Spalt (Abstand) 98 vorhanden, wobei die Krümmungen des Vorderrands 36 des Reflektors 10 und des Rands 96 des Abschnitts 34 so ausgebildet sind, daß der Spalt 98 bei einer Verschwenkbewegung des Reflektors 10 um die Achse 38 zumindest annähernd konstant bleibt. Vorzugsweise sind der Vorderrand 36 des Reflektors 10 und der Rand 96 des Abschnitts 34 in Schnitten senkrecht zur Achse 38 zumindest annähernd kreisbogenförmig ausgebildet, wobei deren Mittelpunkte zumindest annähernd auf der Achse 38 zu liegen kommen. Der Rand 96 weist dabei einen um die Größe des Spalts 98 größeren Radius auf als der Vorderrand 36. Eine gewisse Abweichung der Krümmungen des Rands 96 und des Vorderrands 36 ist je nach Größe des Spalts 98 möglich.

Nachfolgend wird die Funktionsweise der Verstelleinrichtung des vorstehend beschriebenen Scheinwerfers erläutert. Zu einer Verstellung des Reflektors 10 wird die Einstellschraube 88 verdreht, die wiederum über ihren in die Schneckenverzahnung des Endes 60 eingreifenden Gewindeabschnitt 90 eine Verdrehung des Verstellelements 54 um die Achse 38 bewirkt. Bei einer Verdrehung des Verstellelements 54 wird dessen exzentrischer Abschnitt 68 ebenfalls verdreht, führt jedoch wegen seiner zur Achse 38 exzentrischen Ausbildung auch eine Bewegung senkrecht zur Achse 38 und tangential zur Achse 74 aus, um die das Übertragungselement 70 schwenkbar ist. Die tangentiale Bewegungskomponente des exzentrischen Abschnitts 68 wird auf das Übertragungselement 70 übertragen, in dessen Ausnehmung 80 der Abschnitt 68 mit geringem Spiel in tangentialer Richtung aufgenommen und somit mit diesem gekoppelt ist. Das Übertragungselement 70 wird dabei an seinem im Gehäuse 22 gelagerten unteren Endbereich 72 um die Achse 74 verschwenkt. Der obere Endbereich 76 des Übertragungselements 70 führt dabei eine Verschwenkbewegung um die Achse 74 aus, die durch dessen Verbindung mit dem Halterahmen 40 auf diesen übertragen wird. Der Halterahmen 40 und der mit diesem verbundene Reflektor 10 sind über das Lagerelement 50 und das Verstellelement 54 gelagert und führen dadurch eine Verschwenkbewegung um die Achse 38 aus, so daß der Verlauf der optischen Achse 39 des Reflektors 10 in vertikaler Richtung verändert wird. Die Neigung der optischen Achse 39 des Reflektors 10 und damit des vom Reflektor 10 reflektierten Lichtbündels nach unten ist am größten, wenn der exzentrische Abschnitt 68 so angeordnet ist, daß dessen größte Exzentrizität bezüglich der Achse 74 tangential in Lichtaustrittsrichtung 14 weisend geordnet ist. In dieser Stellung befindet sich der obere Endbereich 76 des Übertragungselements 70 in seiner am weitesten in Lichtaustrittsrichtung 14 verschwenkten Lage. Die Neigung der optischen Achse 39 des Reflektors 10 und damit des vom Reflektor 10 reflektierten Lichtbündels nach oben ist am größten, wenn der exzentrische Abschnitt 68 so angeordnet ist, daß dessen größte Exzentrizität bezüglich der Achse 74 tangential entgegen Lichtaustrittsrichtung 14 weisend angeordnet ist. In dieser Stellung befindet sich der obere Endbereich 76 des Übertragungselements 70 in seiner am weitesten entgegen Lichtaustrittsrichtung 14 verschwenkten Lage. Die Verschwenkbewegung des Reflektors 10 um die Achse 38 ist in keiner Richtung durch einen Anschlag begrenzt, vielmehr kann das Verstellelement 54 über seine vorstehend beschriebenen Extremlagen hinausverdreht werden, wonach erneut eine Verstellung des Reflektors 10 möglich ist. Beim dargestellten Ausführungsbeispiel ist der exzentrische Abschnitt 68 des Verstellelements 54 innerhalb der Ausnehmung 80 in seiner Mittel- oder Nullstellung so angeordnet, daß dessen größte Exzentrizität bezüglich der Achse 38 nach unten oder nach oben weist. Das Verstellelement 54 kann um die Achse 38 um 360 Grad verdreht werden, also über seine vorstehend beschriebenen Stellungen, in denen dessen größte Exzentrizität in oder entgegen Lichtaustrittsrichtung 14 weist, hinausverdreht werden, so daß dessen größte Exzentrizität nach oben weist. Ein zusätzlicher Anschlag zur Begrenzung der Verschwenkbewegung des Reflektors 10 ist nicht erforderlich, vielmehr bestimmen die vorstehend erläuterten Extremstellungen des exzentrischen Abschnitts 68 des Verstellelements 54 Endstellungen des Reflektors 10, über die hinaus der Reflektor 10 bei weiterer Verdrehung des Verstellelements 54 wieder in der anderen Richtung geschwenkt wird. Eine Verstellung des Reflektors 10 ist somit ausgehend von beliebigen Drehstellungen des Verstellelements 54 durch dessen Verdrehen möglich. Ausgehend von der Einstellschraube 88 ist die Schwenkbewegung des Reflektors 10 um die Achse 38 dreimal untersetzt, nämlich erstens durch die Untersetzung zwischen dem Gewindeabschnitt 90 und der Schneckenverzahnung des Endes 60, zweitens durch den exzentrischen Abschnitt 68, der mit dem Übertragungselement 70 gekoppelt ist und drittens durch die Hebelverhältnisse des Übertragungselements 70. Die Untersetzung zwischen dem exzentrischen Abschnitt 68 und dem Übertragungselement 70 ist durch die Größe der Exzentrizität des Abschnitts 68 bezüglich der Achse 38 bestimmt. Die Hebelverhältnisse des Übertragungselements 70 ergeben sich durch die Abstände von dessen Endbereichen 72 und 76 zueinander und zum Angriffspunkt des exzentrischen Abschnitts 68. Die vorstehend beschriebene Verstelleinrichtung ist wegen der starken Untersetzung ausgehend von der Einstellschraube 88 zum Reflektor 10 selbsthemmend, so daß auf den Reflektor 10 wirkende Kräfte, beispielsweise infolge von Erschütterungen während der Fahrt des mit dem Scheinwerfer ausgerüsteten Fahrzeugs, nicht zu einer Verstellung des Reflektors 10 führen können.

Der Vorderrand 36 des Reflektors 10 führt bei einer Verschwenkbewegung des Reflektors 10 um die Achse 38 ebenfalls eine Bewegung um die Achse 38 aus. Durch die vorstehend erläuterte Ausbildung des Vorderrands 36 des Reflektors 10 und des Rands 96 des Abschnitts 34 bleibt der Spalt 98 auch bei einer Verschwenkbewegung des Reflektors 10 zumindest annähernd konstant und kann daher gering gehalten werden.

Patentansprüche

1. Halterungs- und Reflektoraufbau für einen verschwenkbaren Reflektor für einen Fahrzeugscheinwerfer, mit einem Reflektor (10), der an einer Halterung (22) um wenigstens eine Achse (38) ver-

schwenkbar gelagert ist, **dadurch gekennzeichnete** daß der in Lichtaustrittsrichtung (14) weisende Vorderrand (36) des Reflektors (10) und der entgegen Lichtaustrittsrichtung (14) weisende, an den Vorderrand (36) des Reflektors (10) angrenzende Rand (96) eines Teils (34) der Halterung (22) in Ebenen senkrecht zur Achse (38), um die der Reflektor (10) verschwenkbar ist, jeweils gekrümmt ausgebildet sind, wobei die Krümmungen des Vorderrands (36) und des Rands (96) des Teils (34) so ausgebildet sind, daß deren Mittelpunkte zumindest annähernd auf dieser Achse (38) zu liegen kommen und zwischen dem Vorderrand (36) und dem Rand (96) ein Abstand (98) gebildet ist, der bei einer Verschwenkbewegung des Reflektors (10) um die Achse (38) zumindest annähernd konstant bleibt.

2. Halterungs- und Reflektoraufbau nach Anspruch 1, dadurch gekennzeichnet, daß der Teil (34) der Halterung (22) sich entgegen Lichtaustrittsrichtung (14) verjüngend ausgebildet ist.

3. Halterungs- und Reflektoraufbau nach Anspruch 1, dadurch gekennzeichnet, daß der Teil (34) einstückig mit der Halterung (22) ausgebildet ist.

4. Halterungs- und Reflektoraufbau nach Anspruch 1, dadurch gekennzeichnet, daß die Achse (38), um die der Reflektor (10) verschwenkbar ist, nahe der optischen Achse (39) des Reflektors (10) und etwa senkrecht zu dieser verläuft.

5. Halterungs- und Reflektoraufbau nach Anspruch 4, dadurch gekennzeichnet, daß die Achse (38) zumindest annähernd in einer Längsmittelebene des Reflektors (10) verläuft.

6. Halterungs- und Reflektoraufbau nach Anspruch 1, dadurch gekennzeichnet, daß die Halterung (22) ein Gehäuse ist, innerhalb dem der Reflektor (10) angeordnet ist.

Hierzu 2 Seite(n) Zeichnungen

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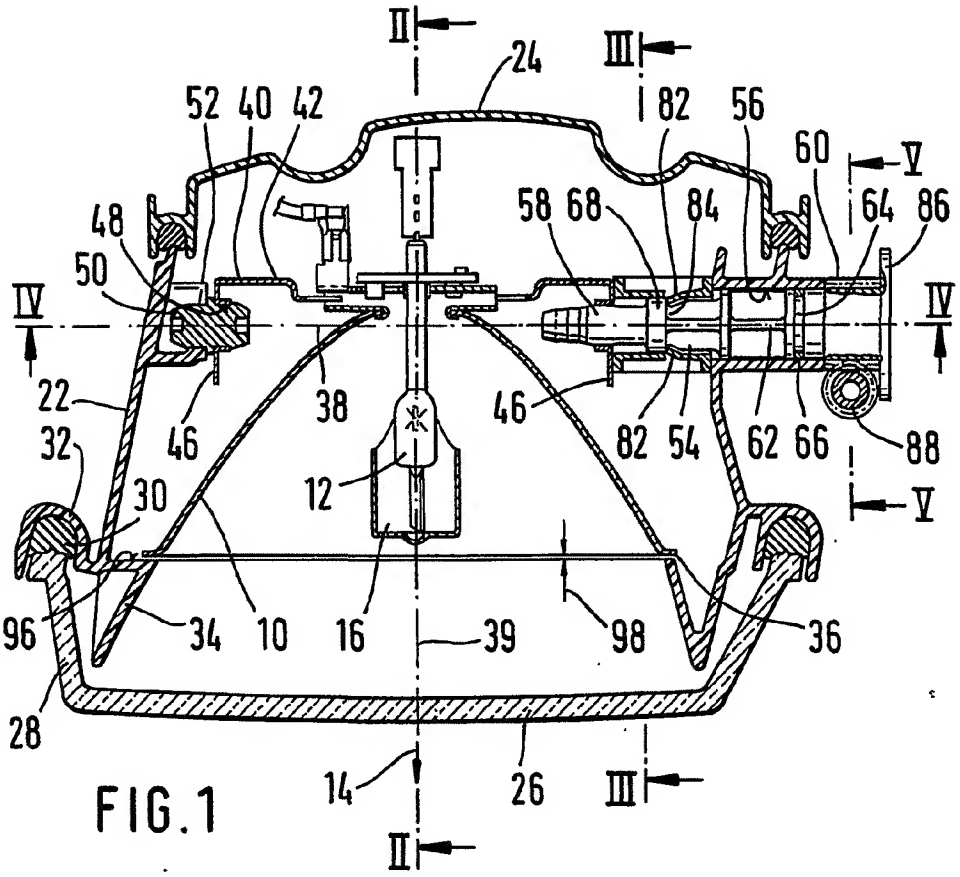

FIG.1

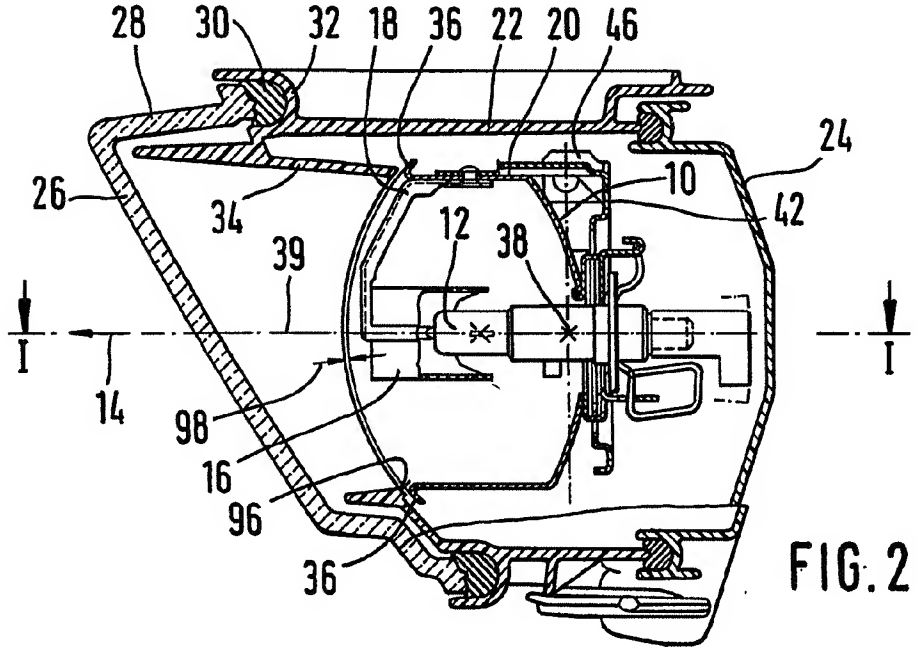

FIG.2

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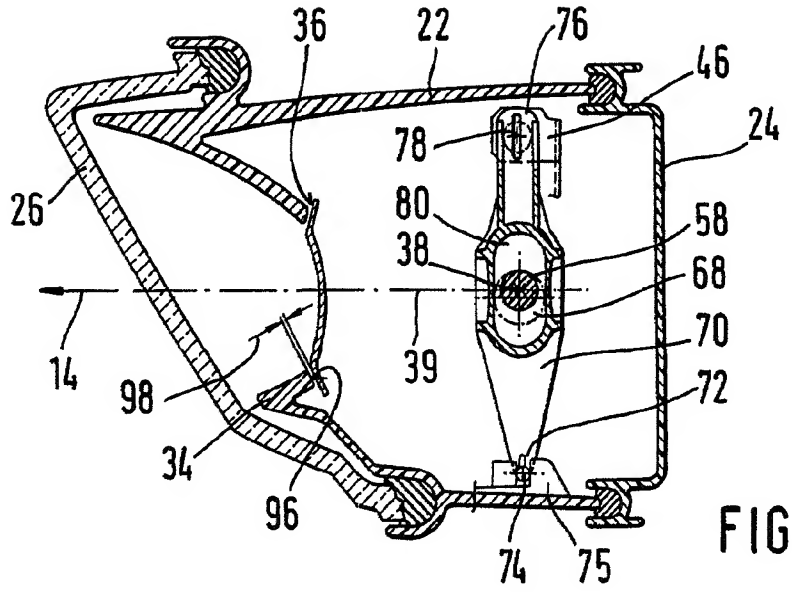

FIG. 3

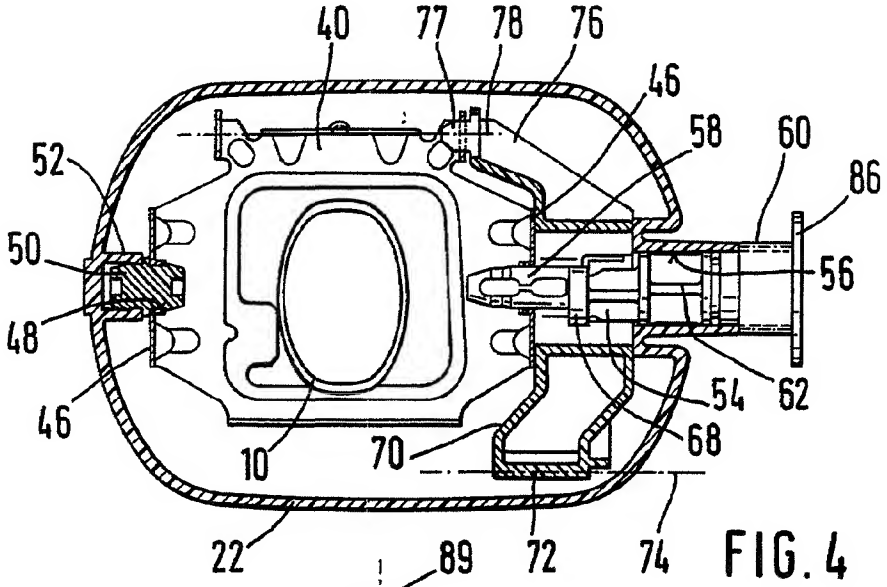

FIG. 4

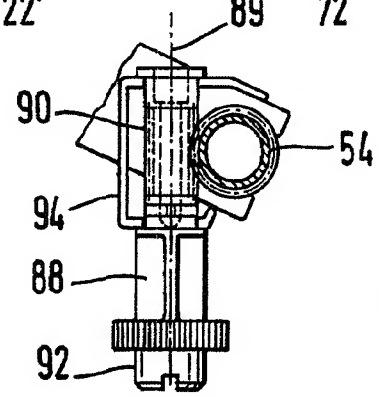

FIG. 5